JamesHardie™

Environmental Product Declaration

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

Fiber Cement Products from James Hardie

Program: EPD International — www.environdec.com
Program Operator: EPD International
EPD Registration Number: S-P-05037
Publication Date: 21 December 2022
Valid Until: 21 December 2027
Geographic Scope: North America

EPD® ENVIRONMENTAL PRODUCT DECLARATION

ECO PLATFORM EPD VERIFIED

Contents

1.0

About Us

James Hardie is the world's number one producer and marketer of high-performance fiber cement products. As a trusted industry leader, James Hardie is committed to offering endless design possibilities for exteriors and interiors through innovative, durable, and sustainable solutions.

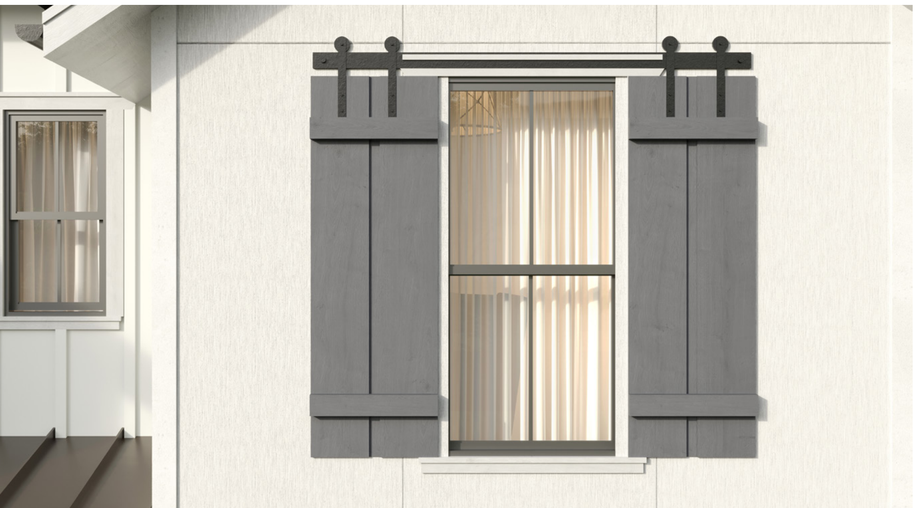
As part of this mission, James Hardie applies a continuous improvement mindset to research and development, manufacturing and sales. James Hardie helps inspire and deliver beautifully designed homes and buildings that are durable, functional and easy to build.

James Hardie's innovative and durable solutions combine lasting beauty and endless design possibilities with trusted protection and low maintenance. Key to this effort is James Hardie's drive to develop quality solutions that are built to last, improving the liveability and streetscape for homeowners and communities alike.

1.0

Integrated Approach to Sustainability

James Hardie is undertaking a transformation to deliver greater value to our consumers and the community. Our global strategy for value creation embeds the sustainability principles and practices that inform our environmental, social and governance (ESG) strategy.



We strive to be a leader in sustainability performance and reporting through the integration of sustainability objectives into our day-to-day operations, such as:

We deliver long-term value through our responsibly produced line of high-quality, built-to-last products.

Our product design and innovation consider the sustainability-related impacts and ongoing enhancements.

We prioritize Lean Manufacturing to promote resource conservation and waste reduction.

Our people are at the heart of all we do. Fostering high levels of engagement and a culture in which people can thrive promotes shared success.

The Zero Harm foundation prioritizes the safety of our products and employees, partners, customers and communities.

In the coming years, we will continue to develop our sustainability strategy and define the next steps in our ESG journey.

2.0

Our Fiber Cement Products

James Hardie understands building professionals and homeowners alike, providing them with innovative building products and solutions. Hardie® fiber cement products are deemed non-combustible and are resistant to damage from moisture, termites, rotting and warping when installed and maintained correctly. They are impact resistant, low maintenance and highly durable.

Trusted Protection

Durability

- Trusted protection
- Fire
- Pests
- Extreme weather
- Water resistant

Finishing Technology

- Long lasting primer

ColorPlus® Technology Finishes

- Exceptional finish adhesion
- Superior color retention
- Superior UV resistance

Hardie™ Zone System

Engineered for Climate®

- Topographical factors
- Extreme temperature change
- Rain
- High humidity
- Ultraviolet light
- Hurricanes
- Hail
- Snow
- Resisting shrinking, swelling and cracking

Warranty

Unlike other brands, James Hardie doesn't prorate our siding and trim limited warranty. We stand 100% behind our siding for 30 years and our trim for 15 years.

- Hardie® Siding 30-year non-prorated limited warranty
- Hardie® Trim 15-year non-prorated limited warranty
- ColorPlus® Technology 15-year limited finish warranty

Product Range & Descriptions

EXTERIOR

Hardie® Architectural Panel
HZ5®/HZ10®

From traditional to more modern look homes, the clean lines of the Hardie® Architectural Panels will impress. Panels are available in a range of textures, including Fine Sand, Fine Sand-Grooved, Mounded Sand, Sea Grass, and are available in three different sizes, 4’x8’, 4’x10’ and 4’x12’.

Hardie® Plank
HZ5®/HZ10®

From Victorians to Colonials, Hardie® Plank is the perfect siding for your style, with durability and long-lasting beauty that will transform your home’s aesthetic. Hardie® Plank is available in different textures and in the following widths, 5.25”, 6.25”, 7.25”, 8.25”, 9.25” and 12”.

Hardie® Panel
HZ5®/HZ10®

Hardie® Panel delivers style and substance with its crisp, clean lines and ability to pair beautifully with other siding products. A smart choice for the home of your dreams, Hardie® Panel is available in a range of textures and three different sizes, 4’x8’, 4’x10’, 4’x12’.

Hardie® Shingle
HZ5®/HZ10®

Hardie® Shingle embodies the enchanting look of cedar shingles with lower maintenance, creating your perfect exterior style. Better than the real thing, Hardie® Shingle resists rotting, curling, warping and splitting. Hardie® Shingle Siding is available in both staggered and straight edge.

Hardie® Trim
HZ5®/HZ10®, NT3®

Hardie® Trim is the perfect option for a long-lasting home. Hardie® Trim is a low maintenance and durable accent for your exterior. Hardie® Trim is available in different widths: 2.5” (batten), 3.5”, 5.5”, 7.25”, 9.25”, 11.25” and thickness 4/4 (0.75”) & 5/4” (1.00”).

Availability of Hardie® products with ColorPlus® Technology finishes and textures vary by region.
Contact your local representative for availability in your region.

Product Range & Descriptions

EXTERIOR

Hardie® Soffit Panels
HZ5®/HZ10®

Hardie® Soffit Panels are available in two lengths, 8’ & 12’, and four widths, 12”, 16”, 24” & 48”. These are available in two textures, Smooth and Select Cedarmill® both offered in Vented and Non-Vented options.

Hardie® Reveal® Panel
HZ5®/HZ10®

The customizable Hardie® Reveal® Panel expands modern design options with smooth, 7/16-inch-thick panels.

Artisan® Siding
HZ5®/HZ10®

The 5/8-inch thickness and unique features of Artisan® Siding from the Aspyre Collection by James Hardie® provides a precise fit and finish as well as the freedom to miter corners for attractive, streamlined styling.

INTERIOR

Hardie® Backer Board 0.42”

Hardie® Backer Board 0.42” cement board is resistant to damage from moisture. The smooth surface allows for finishing with paint, wallpaper or texture.

Hardie® Backer Board 1/4” (EZ Grid®)

This light, simple-to-cut, no-mesh board features our exclusive EZ Grid® recessed fastener pattern, making installation even easier.

Availability of Hardie® products with ColorPlus® Technology finishes and textures vary by region.
Contact your local representative for availability in your region.

3.0

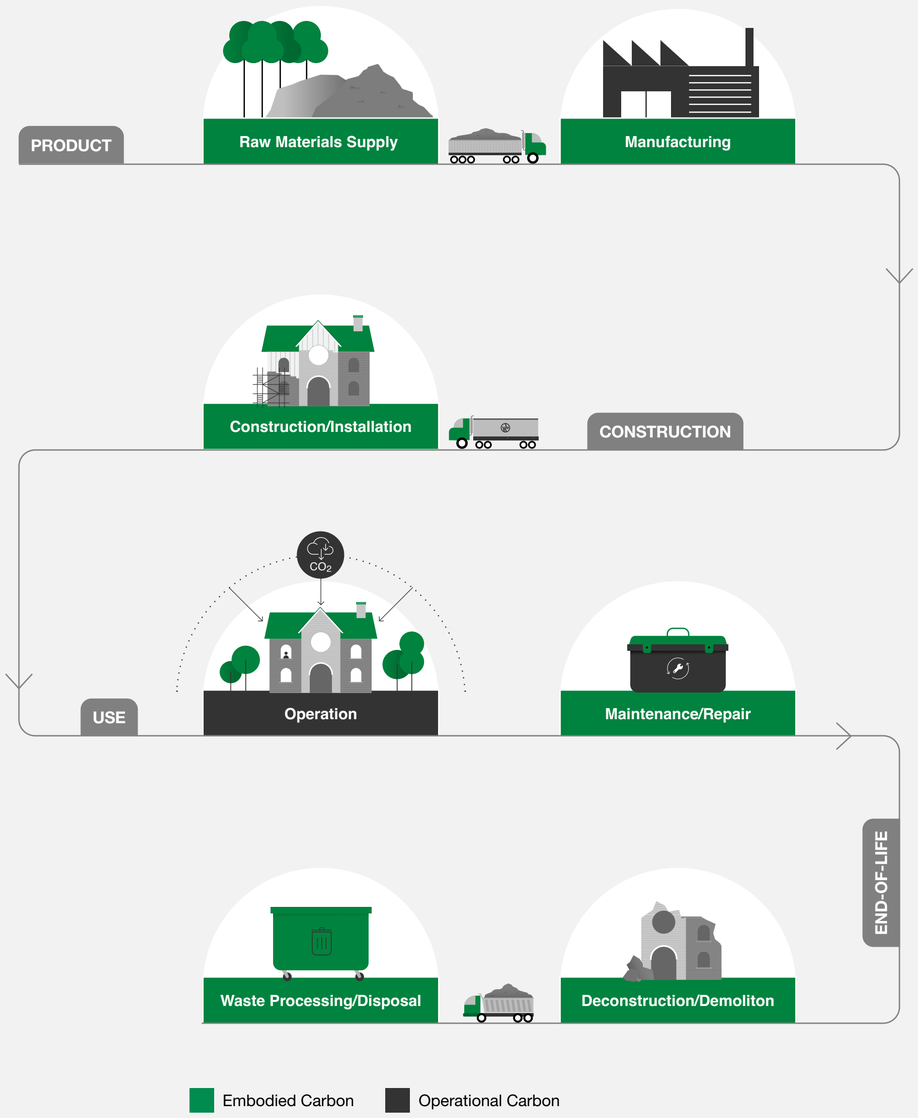
Our Commitment to Innovative, Durable and Sustainable Solutions

Hardie® fiber cement products capture CO_2 from the environment during their life cycle.

Carbon emissions, commonly referred to as embodied carbon, are released not only during a building's operational life but also during the manufacturing, transportation, construction and end of life phases of all built assets – buildings and infrastructure. According to the World Green Building Council, embodied carbon in buildings contributes around 11 percent of all global carbon emissions. The graphic to the right highlights the phases where embodied and operational carbon are released. Differing from other materials, during the Operation phase, fiber cement products capture CO2 from the environment.

James Hardie's disciplined approach to Lean Manufacturing helps us deliver quality products, with less. James Hardie's Lean Manufacturing promotes resource conservation and waste reduction, providing building professionals and homeowners with the trusted protection and low maintenance they need, whilst helping builders reduce the environmental impact of their builds.

Delivering long-term value through our responsibly produced line of high-quality, built-to-last products. James Hardie's product design and innovation considers sustainability related impacts and ongoing enhancements that deliver lasting beauty and endless design possibilities, that are resource efficient and low impact across all phases of the product life cycle.



3.1

Life Cycle Assessments

As part of James Hardie's long-standing commitment to transforming the way the world builds through innovative, durable, and sustainable solutions, James Hardie has been developing and continually improving the low maintenance and high durability of its products through Life Cycle Assessments. This process involves identifying, quantifying, and innovating to improve the durability and environmental impact of its products across their life cycle.

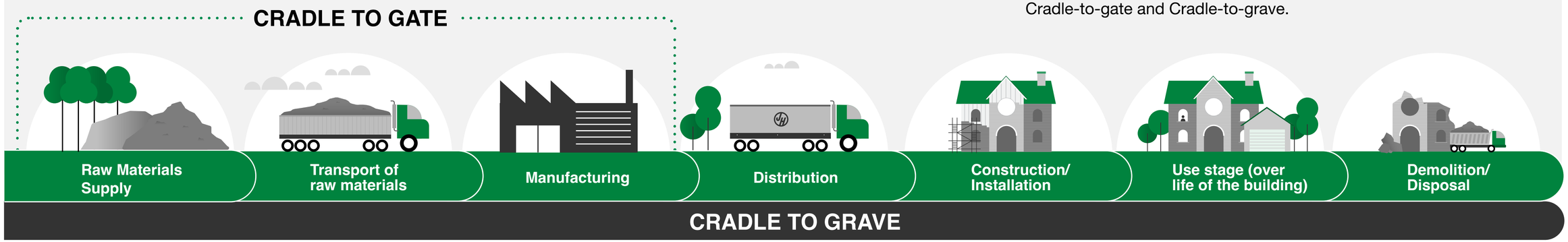
A Life Cycle Assessment (LCA) is a standardised international method for identifying and quantifying the environmental impact or footprint of a product across its life cycle. Undertaking a LCA involves the following steps:

- Setting the goals and scope of the life cycle assessment
- Identifying all the environmental inputs and outputs associated with a product
- Assessing the environmental impact of the product across the chosen scope
- Interpreting the findings of the assessment and providing recommendations.

A LCA can identify the environmental impacts of a product and help organizations make improvements to their products and processes. However, not all LCAs are the same. They vary in scope, based on the goal and purpose of the assessment. Generally, there are two types of LCAs:

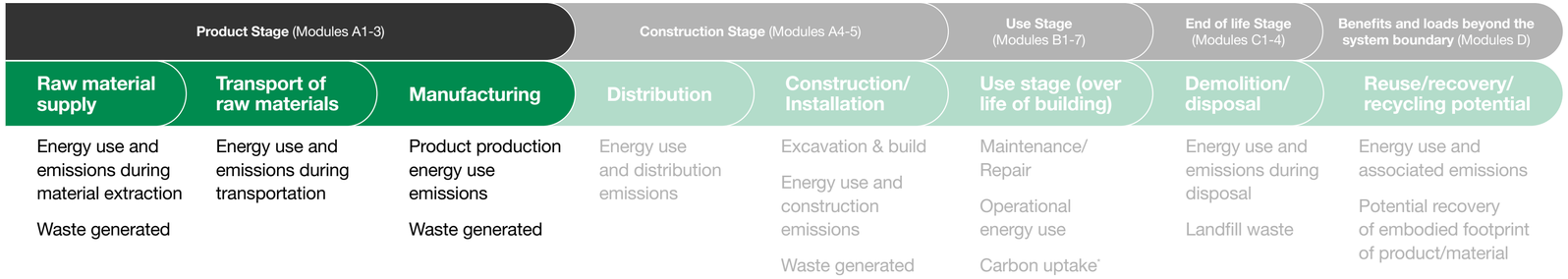
1. Cradle-to-gate
2. Cradle-to-grave

The graphic below shows the difference in scope between Cradle-to-gate and Cradle-to-grave.



Cradle-to-gate Life Cycle Assessments

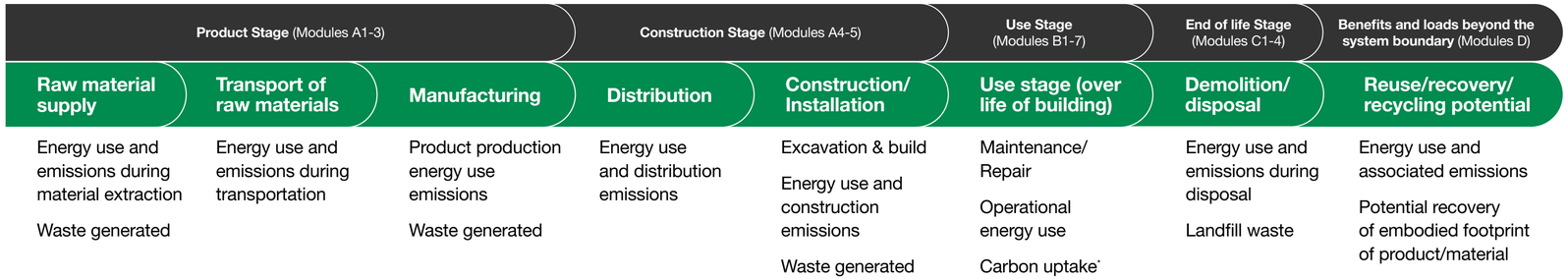
Cradle-to-gate assessments have a smaller scope, with these assessments only focusing on the environmental impacts from raw material extraction through to the manufacturing of products. These assessments do not assess the environmental impacts of the products once it leaves the factory ‘gate’.



Cradle-to-grave Life Cycle Assessments

Cradle-to-grave assessments are a more comprehensive approach that considers the full impact from the raw material extraction (i.e., cradle) right through to the end-of-life of the product (i.e., grave). As well as the stages considered in a cradle-to-gate LCA, this type of assessment also considers the following additional lifecycle stages:

- Impacts from the construction process
- Impacts during the use phase
  - Operational impacts of the building over its lifetime
  - Impacts from maintenance or repair
- Impacts from demolition and disposal at end of life



***Carbon Uptake/ Recarbonation**

Recarbonation refers to the process where concrete reacts with the air and reabsorbs CO_2 over the life of the product.

Unlike Cradle-gate, Cradle-to-grave LCAs provide a complete view of a products impacts over the whole lifetime of a building, through to its demolition or disposal, providing a comprehensive view of a products environmental impact.

Comparing Life Cycle Assessments

LCAs are one of the best tools for helping building professionals and homeowners understand the environmental impacts of their building products. LCA calculations are used to develop Environmental Product Declarations (EPDs), which are third-party verified documents that outline the environmental impact of a product. As EPDs do not certify whether products are environmentally superior to alternatives, it's crucial to understand the differences between the LCAs used when making comparisons between products, to confirm you're comparing like for like.

There are three things to look out for when comparing LCAs within Environmental Product Declarations (EPDs):

1. Confirm the EPD scope, e.g., cradle-to-gate, cradle-to-grave or other.
2. Confirm the 'declared unit' and make sure the products you are comparing use the same units.
3. When evaluating a product's climate impact (i.e., emissions) use the Global Warming Potential (GWP) measure.

	Cradle-to-gate	Cradle-to-grave
⊕ **Pros**	⊕ Smaller scope means some organizations choose these assessments, as they are significantly less complex to compile.	⊕ Best practice approach to evaluate a product's impact across the full product life cycle.
	⊕ More financially viable for organizations	⊕ Best form of environmental information for making informed sustainability decisions.
	⊕ Do not require additional methodologies to achieve EPD certification.	⊕ Cradle-to-grave assessments can be used for Green Star rating*.
		⊕ Helps organizations reduce their environmental risks by understanding their holistic impacts.
		⊕ Improves brand value/ competitive advantage as the scope enables authentic communication of positive environmental attributes.
		⊕ Conclusions and data may help facilitate greater collaboration across life stages to overcome impacts.
⊖ **Cons**	⊖ They exclude several significant stages of a product's full life cycle and therefore this means it only represents a part of a product's life cycle and does not offer the full picture for reducing embodied carbon.	⊖ More complex to compile and develop
	⊖ Conclusions may not be as beneficial to strategic planning due to the limited scope of lifecycle stages and thus misinform sustainability commitments/ actions.	⊖ Requires greater financial investment
		⊖ Requires sub-Product Category Rules (sub-PCR) methodologies and the function unit to be per complementary Product Category Rules (c-PCR) to achieve EPD certification.

* Green star rating is an internationally recognised rating system for buildings.

3.2

James Hardie's Life Cycle Assessment

Within the construction industry, cradle-to-gate LCA's are more common, however, as part of James Hardie's ESG journey, and aim to lead in sustainability performance, we identified ways that we could go further than a cradle-to-gate approach.

James Hardie's LCA is based on a Cradle-to-Grave scope and takes into account the availability of data, services, and tools used to calculate the impact of our products*.

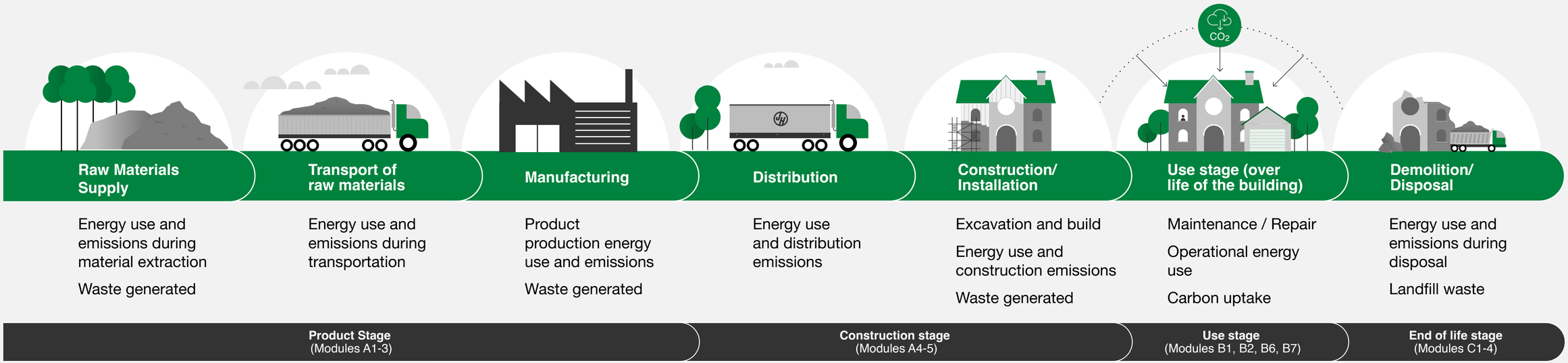
The repair, replacement, refurbishment stages (modules B3, B4 and B5) have been excluded for the purposes of this LCA. The reuse, recycle or recovery stages are excluded due to the limited recycling or recovery of these types of products through today's practices.

Jame Hardie's EPD is complete for Cradle-to-Grave assessments and comparisons with other like-for-like product EPDs. By including all the applicable life cycle data and life cycle results, James Hardie's has been able to better capture the impact across the life cycle of its products.

* Known as a cradle-to-gate with options

Product Stage (Modules A1-3)			**Construction Stage** (Modules A4-5)		**Use Stage** (Modules B1-7)	**End of life Stage** (Modules C1-4)	**Benefits and loads beyond the system boundary** (Modules D)
Raw material supply	**Transport of raw materials**	**Manufacturing**	**Distribution**	**Construction/ Installation**	**Use stage (over life of building)**	**Demolition/ disposal**	**Reuse/recovery/ recycling potential**
Energy use and emissions during material extraction Waste generated	Energy use and emissions during transportation	Product production energy use emissions Waste generated	Energy use and distribution emissions	Excavation & build Energy use and construction emissions Waste generated	Maintenance/ Repair Operational energy use Carbon uptake	Energy use and emissions during disposal Landfill waste	Energy use and associated emissions Potential recovery of embodied footprint of product/material

3.3



James Hardie's role in providing trusted and comprehensive data and information

As the world's number one producer and marketer of high-performance fiber cement building solutions and a trusted industry leader, James Hardie understands its role in providing trusted and comprehensive data and information in an easy and accessible format.

The durability of Hardie® products can provide advantages and can help contribute to a more resilient built environment. To deliver buildings with lower life cycle carbon and environmental impacts as well as healthier environments for the occupants, James Hardie strives for continual improvements to manufacturing processes to reduce the environmental impact of our products over their full life cycle.

James Hardie is committed to working with architects, builders, and homeowners to assist them in arriving at bespoke solutions that meet both their environmental and design needs. At James Hardie we believe this leadership position and transparency will not only set an example for industry, but also help all building professionals and homeowners make better and more informed decisions.

4.0

Life Cycle Assessment Information

Program information

Program: EPD International

EPD International AB
Box 210 60
SE-100 31 Stockholm

w: environdec.com
e: info@environdec.com

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product category rules (PCR): PCR 2019:14 Construction products (EN 15804+A2) (1.11); UN CPC Code: 37570, 2021-02-05

PCR review was conducted by:
The Technical Committee of the International EPD® System.

Moderator: Martin Erlandsson, IVL Swedish Environmental Research Institute,

e: martin.erlandsson@ivl.se

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

☐ EPD process certification ☑ EPD verification

Third party verifier

Lindita Bushi, Athena Sustainable Materials Institute

1-416-269-8571

e: Lindita.bushi@athenasmi.org
w: athenasmi.org

In case of recognised individual verifiers:

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

☐ Yes ☑ No

This is a manufacturer-specific EPD. The products are produced across 10 different manufacturing sites across the US.

Scope: Cradle to gate with module C1-C4, module D and optional modules (A1-A3, A4-A5, B1-B2, C1-C4).

The EPD owner has the sole ownership, liability, and responsibility for this EPD.

EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD

303 East Wacker Dr, 26th Floor
Chicago, Illinois 60601

Contact Person:
Shamim Imani, Global ESG Leader

303 East Wacker Dr, 26th Floor
Chicago, Illinois 60601

t: 1-888-542-7343
w: jameshardie.com.au

For the product offering in other markets please contact local sales representative or visit jameshardie.com

EPD Produced by

Edge Environment

Xinyue Zhang, Laura Loucks and Jonas Bengtsson
269 Cordaville Road
Southborough, MA 01772, USA

t: +1 774 206 9172
e: info@edgeenvironment.com.au
w: edgeenvironment.com.au

Product Information

TABLE 2 PRODUCT INFORMATION

Product Characteristics		
Product	**Panel Nominal Thickness (mm)**	**Weight (kg/m²)**
Hardie® Architectural Panel HZ5®	7.85	9.78
Hardie® Architectural Panel HZ10®	7.85	9.79
Hardie® Plank HZ5®	7.85	9.78
Hardie® Plank HZ10®	7.85	9.79
Hardie® Panel HZ5®	7.85	9.78
Hardie® Panel HZ10®	7.85	9.79
Hardie® Shingle HZ5®	6.3	7.86
Hardie® Shingle HZ10®	6.3	7.85
Hardie® Trim 5/4 HZ5®/HZ10®	25	25.94
Hardie® Trim 5/4 NT3®	25	30.34
Hardie® Trim 4/4 HZ5®/HZ10®	19	19.71
Hardie® Trim 4/4 NT3®	19	23.06
Hardie® Soffit Panels HZ5®	6.3	7.85
Hardie® Soffit Panels HZ10®	6.3	7.85
Hardie® Reveal® Panel	10.7	13.65
Artisan® Siding HZ5®	16	19.93
Artisan® Siding HZ10®	16	19.94
Artisan® Trim	38	46.12
Hardie® Backer Board 0.42”	10.7	10.62
Hardie® Backer Board 1/4" (EZ Grid®)	6.3	6.25

UN CPC code: CPC 37570

LCA information

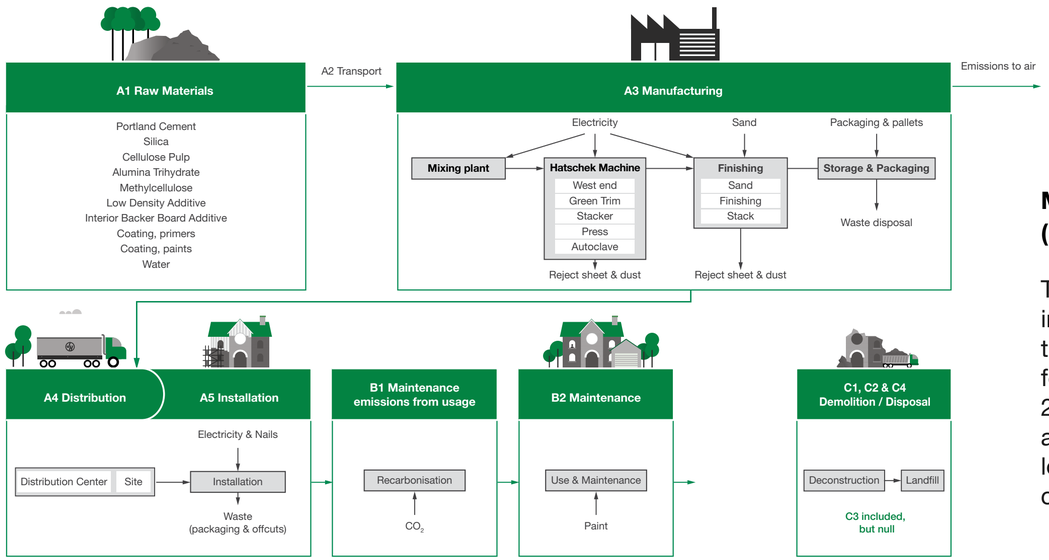
James Hardie's LCA calculates the environmental footprint at each of the following stages: product, construction, use, and end-of-life. All the significant environmental impacts associated with the product, including the impact on water, air, land and climate change are reported based on international ISO LCA standards.

This product declaration is based on the report "James Hardie US EPD LCA Background Report" by Edge Environment Pty Ltd and verified by Lindita Bushi with the Athena Sustainable Materials Institute.

TABLE 4 PRODUCT CHARACTERISTICS

Product Characteristics	
Declared Unit	1 square meter of installed external cladding product over its reference service life (RSL) of 50 years.
System Boundary	Cradle to gate with options, modules C1–C4, and module D with additional modules (A1-A3 + C + D and additional modules). The additional modules are A4-A5 and B1-B2. Module D has been scoped out of the project since all products go to landfill at the end-of-life.
Reference Service Life (RSL)	50 years
Geographical Coverage	North America
Time Period	Foreground was provided first-hand by James Hardie for CY20 (2020-01-01 to 2020-12-31)
Databases used	Ecoinvent v3.6 (all background data is less than 10 years old)
Software	SimaPro (v9.1.1.1)

FIGURE 1 SYSTEM DIAGRAM



Modules declared, share of specific data (in GWP-GHG indicator) and data variation:

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

RSL of 50 years is not a claim or warranty by James Hardie

Product Characteristics

TABLE 5 THE LIFE CYCLE OF A BUILDING PRODUCT

Product Characteristics						
GPI Module	**Asset life cycle stage**		**Reported (X = included in the EPD, ND shall not be regarded as an indicator result of zero),**	**Specific Data**	**Variation - Products**	**Variation - sites**
Upstream	A1	Raw material supply	X	>90%	Not relevant	<10%
	A2	Transport	X	>90%	Not relevant	<10%
Core	A3	Manufacturing	X	>90%	Not relevant	<10%
Downstream	A4	Transport	X	>90%	Not relevant	<10%
	A5	Construction, installation process	X			
	B1	Material emissions from usage	X			
	B2	Maintenance	X			
	B3	Repair	ND			
	B4	Replacement	ND			
	B5	Refurbishment	ND			
	C1	Deconstruction and demolition	X			
	C2	Transport	X			
	C3	Waste processing	X			
	C4	Disposal	X			
Other environmental information	D	Reuse, recycle or recovery	ND			

ND = not declared

In the results section, the following products have been grouped together and considered the same formulation and thickness for the sole limited purpose of this assessment.

- Hardie® Soffit Panels HZ10®
- Hardie® Shingle HZ10®

- Hardie® Plank HZ10®
- Hardie® Panel HZ10®
- Hardie® Architectural Panel HZ10®

- Hardie® Plank HZ5®
- Hardie® Panel HZ5®
- Hardie® Architectural Panel HZ5®

The following life cycle stages are deemed not applicable for James Hardie: Repair (B3); Replacement (B4); Refurbishment (B5), and Reuse, recycle, or recovery (D) over the stated RSL. The scenarios included are currently in use and are representative for one of the most likely scenario alternatives

Content Information

TABLE 6 MATERIAL CONTENT

Material Input	Percent composition for 1kg of product
Cement	20–45%
Silica (sand)	30–65%
Cellulose Pulp	0–10%
Hydrated Alumina	0–10%
Coatings – primer & paint	–
Water[2]	–

[2] Water used in the material inputs is evaporated by the final product

Raw Materials, Packaging, and Transportation from Supplier (Module A1 and A2)

The inventory data collected from James Hardie for production year 2020 is available above. In summary, products are produced from:

- Cement, cellulose pulp, silica, hydrated alumina, recycled process material and water.
- All exterior products use primers and/or paints.
- All trim products also use a density modifier additive in addition to the above.
- Material transportation to manufacturing sites was assumed to be an average distance of 130km by truck. The interior backer board additive material also included a transportation distance of 9186 nautical km by ship.
- Typical packaging is made up from gluts.
- The cellulose pulp is assumed to have 12.2MJ/kg as renewable energy resource used as raw material, based on the energy density quoted for biomass municipal and industrial materials in the National Greenhouse Accounts Factors (Department of the Environment, 2014)[3].
- The cellulose pulp is assumed to have a material carbon content of 0.5kg C per kg of dry mass (Quantis, 2020).

Product Manufacturing (Module A3)

Typical production process includes the use of energy (electricity, gas, diesel, etc). Energy consumption was allocated to each product based on its portion of the overall yearly production (in STDM[4]) for each production site. Electricity is modeled with the regional grid of each plant location.

Transport (Module A4)

Transportation distances from James Hardie's gate to distribution center was calculated based on primary data from James Hardie, including total annual distance and number of trips by site. Total annual distance divided by total number of trips is the average distance for each site. The transport is mass constrained. The following conservative average transport distance assumption: The distance each product traveled is an average of the distance from each plant that product is produced in.

Installation (Module A5)

The following assumptions have been used in this study to model installation:

- The installation of these products consists of fastening to the building surface with nails and screws, using a elastomeric sealant, if required, and touching up the surface with paint for any knicks and gouges[5].
- Energy (electricity) consumption for construction and deconstruction has been calculated based on the consumption of 0.20 kWh of electricity per m^2 of products installed[6], coming from using a 1kW power tool for about 12 min per m^2.
- The amount of nails, screws, and elastomeric sealant has been determined by James Hardie's expert judgement and experience in the industry.
- 5% of the products delivered to site end up as waste from damaged products, cutting for hips and gable ends, and are disposed in landfill. Consequently, for the cradle to gate with options scope 1.05 m^2 of products have to be produced and delivered to site for each 1 m^2 of product used in the building.

Recarbonation (B1)

Carbonation is a natural process whereby concrete absorbs carbon dioxide (CO_2) from the atmosphere through a chemical reaction between the CO2 in the ambient air and hydration products within the concrete ($CaOH_2$). Concrete products can be subject to carbonation from the use stage onward (i.e. after construction and curing). From a life cycle impact accounting perspective, this process can also be referred to as 'reabsorption', since the CO_2 emitted during the cement manufacturing process can be partly offset by the lifetime absorption of CO_2, therefore reducing the net CO_2 emissions associated with the concrete over its lifetime.

This LCA report has used the Global Cement and Concrete Association's (GCCA) tool for quantifying carbon reabsorption. This tool was developed with Quantis and is available at https://gccassociation.org/sustainability-innovation/environmental-product-declarations/. The results are included in the GWP-fossil, GWP-T, and GWP-GHG indicators.

Assumptions

- Outside and inside areas are exposed to air[7]
- Exterior products assume exposed to rain
- Interior products assume sheltered
- 50 years Reference Service Life

[3] Standard meters is calculated by dividing the product's thickness by the standard thickness of 7.95 millimetres and multiplying by the square meters.
[4] STDM — Standard meters is calculated by dividing the product's thickness by the standard thickness of 0.09525 meters and multiplying by the square meters.
[5] Assumptions taken from https://www.jameshardie.com/product-support/resource-center/installation
[6] Assumption taken from James Hardie Australia/New Zealand EPD
[7] There is enough area behind the board that allows water to drain after installed and dry out behind the boards, so there is air on the exposed and building-side sides.

Maintenance (Module B2)

The exterior facing product side is assumed to be re-painted every 15 years, over the 50-year RSL of the product, for a total of three cycles[8]. It is assumed that fiber cement products have a lifespan of 50 years. The amount of 3.33 cycles per reference service life is used as a theoretical value.

For the purposes of this study, Reference Service Life is assumed to be 50 years based on available papers and industry publications.

Disposal / Reuse / Recycling (Module C1-C4)

There are various options for products use at its end-of-life scenario. Theoretically, the external cladding products could be either deconstructed, diverted for material recovery, disposed at landfill or a combination of these as described in the following scenarios:

- **Scenario A:** Dismantled and disposal at inert waste landfill.
- **Scenario B:** Dismantled in undamaged form and reused according to its original purpose or as foundation wall protection.
- **Scenario C:** Dismantled in damaged form and used as infill material for Solid Wall System (materials recycling).

The cradle to gate with options environmental profile is based on the assumed most conservative scenario, which is scenario A, since a market or demand does not exist. We have assumed 20km delivery distance to landfill, based on the distance from likely construction sites within major cities to main landfill sites for the area. Transport to landfill is modelled based on 50% loaded rigid trucks (no empty return trips). The scenarios included are currently in use and are representative for one of the most probable alternatives.

Cut-off rules

It is common practice in LCA/LCI protocols to propose exclusion limits for inputs and outputs that fall below a threshold % of the total, but with the exception that where the input/output has a “significant” impact it should be included. According to the PCR 2019:14, the Life Cycle Inventory data for a minimum of 95% of total inflows (mass and energy) per module to the upstream and core module shall be included, accounted as global warming potential (GWP) or energy consumption. Inflows not included in the LCA shall be documented in the EPD. Data gaps in included stages in the downstream module shall be reported in the EPD, including an evaluation of their significance.

In accordance with the PCR 2019:14, the following system boundaries on manufacturing equipment and employees are excluded:

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

Allocation

According to EN 15804+A2, in a process step where more than one type of product is generated, it is necessary to allocate the environmental stressors (inputs and outputs) from the process to the different products (functional outputs) in order to get product-based inventory data instead of process-based data. An allocation problem also occurs for multi-input processes.

In an allocation procedure, the sum of the allocated inputs and outputs to the products shall be equal to the unallocated inputs and outputs of the unit process.

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

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

[8] Assumption taken from the report by W. R. Lawson and Associates (2008), ‘Embodied energy on selected James Hardie New Zealand Wall Products’.

Data Quality and Validation

The primary data used for the study (core module) is based on direct utility bills or feedstock quantities from James Hardie's procurement records. Edge used contribution analysis to focus on the key pieces of data contributing to the environmental impact categories. The data was benchmarked against relevant benchmark data in Ecoinvent. Edge considers the data to be of high quality for the core module.

Compliance with Standards

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

- ISO 14040:2006 and ISO14044:2006 which describe the principles, framework, requirements and provides guidelines for life cycle assessment (LCA) (ISO, ISO 14040:2006/Amd1:2020. Environmental management – Life cycle assessment – Principles and framework., 2006) (ISO, ISO 14044:2006/And1:2017/ Amd2:2020. Environmental management – Life cycle assessment – Requirements and guidelines, 2006)
- ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and procedures, which establishes the principles and specifies the procedures for developing Type III environmental declaration programmes and Type III environmental declarations (ISO, ISO 14025:2006 - Environmental labels and declarations - Type III environmental declarations - Principles and procedures, 2006)
- EN 15804+A2:2019: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products (here after referred to as EN15804+A2). (The British Standards Institution, 2021)
- Product Category Rules (PCR) 2019:14, v1.11 – Construction products – Hereafter referred to as PCR 2019:14. (EPD International, 2021)

This Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804+A2 and PCR 2019:14, v1.11.

Sustainability

James Hardie® siding products may contribute to the following LEED New Construction points: MR5 (MR4 for Homes), Recycles Content and MR5 (MR4 for Homes) Regional Materials. In addition, the following product attributes contribute to a variety of sustainability and green building programs:

- Regionally sourced content
- Avoidance of certain chemicals-Red List compliance
- Low-Emitting materials
- Recycled Content

Green Building Programs include:

- ASHRAE 189.1
- CALGreen (BSC, DSA-SS)
- EarthCraft
- ICC-700
- IgCC
- LEED
- Living Building Challenge

Product Characteristics

Standards and testing including:

- ASTM C 1288 Standard Specification for Fiber-Cement Interior Substrate Sheets
- ASTM C1186 Product Specification Standard for Fiber Cement Sheets as Grade II Type A
- Test Methods include (see website for more details):
- ASTM C1185
- ASTM C177
- ASTM G23
- ASTM E84 Flame spread/Smoke
- ASTM E136 Non-Combustibility
- ASTEM E119 Standard Test Method for Fire Tests of Building Construction and Materials
- Fire Propagation (NFPA 285)
- Wildland-Urban Interface (WUI) – Compliant for use in high fire hazard severity zones
- Listed with the ICC-ES in product evaluations ESR-1844, ESR-2290, ESR 2273 with maximum Ultimate Design Wind Speeds over 200 mph
- Listed with the Texas Department of Insurance for recognition in the Texas Windstorm Inspection Program with negative wind pressures up to -100 psf. (reference TDI EC-23 and EC-55)
- Listed in Miami-Dade County Florida Notice of Acceptance for use in High Velocity Hurricane Zones with negative wind pressures of up to -104psf. The listed assemblies have both large and small missile impact resistance ratings. (reference NOA 17-0821.20 17- 0821.21, 17-0724.01, 17-0406.07)
- Listed with the Florida Department of Business and Professional Regulation with Ultimate Wind Speeds of up to 220mph. (reference State of Florida Product Approvals FL13192, FL13223, FL13265, FL10477, FL13265, FL19901)
- Flood Resistance: Hardie® Fiber cement siding is a class 5 flood resistant material (class 5 is the highest flood resistance rating by FEMA)

Key Assumptions and Considerations

TABLE 7 ASSUMPTIONS, CHOICES, AND LIMITATIONS

Assumption or limitation	Impact on LCA results	Discussion
Electricity	Medium	Electricity grid mix was determined by a weighted average the percentage of product produced at each site
Transport from facilities to warehouses	Medium	Data for transport to warehouses was collected in annual distance and number of trips per site for trucks. This data was used to calculate a weighted average for each product.
Transport to facility	Low	Supplier transport to facility was assumed to be an average of 130km
Installation	Minor	Installation is assumed to be the same for all products
Installation and Deconstruction	Low	Installation and deconstruction assumptions taken from James Hardie Australia/New Zealand EPD created in 2015, converted to pounds and square feet units.
Packaging	Low	Pallet bag material and weight taken from https://www.uline.com/BL_7150/Uline-Pallet-Covers, strapping material and weight taken from https://bit.ly/3JVCDTq, Edge protectors material and weight taken from https://bit.ly/3tiWeat
Transport to landfill	Low	End of life transport to landfill assumed to be an average of 20km taken from James Hardie Australia/New Zealand EPD created in 2015

Environmental Performance

The potential environmental impacts, use of resources and waste categories included in this EPD were calculated using the SimaPro v9.1.1.1 tool and are listed in Table 7. All tables from this point will contain the abbreviation only. The LCA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds and safety margins or risks.

TABLE 8 LIFE CYCLE IMPACT, RESOURCE AND WASTE ASSESSMENT CATEGORIES, MEASUREMENTS AND METHODS

Impact Category	Indicator/Abbreviation	Measurement Unit	Assessment Method and Implementation
Potential Environmental Impacts			
Climate change - fossil	Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 equivalents (GWP100)	Baseline model of 100 years of the IPCC based on IPCC 2013
Climate change – biogenic	Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 equivalents (GWP100)	Baseline model of 100 years of the IPCC based on IPCC 2013
Climate change – land use and land use change	Global Warming Potential land use and land use change (GWP-luluc)	kg CO_2 equivalents (GWP100)	Baseline model of 100 years of the IPCC based on IPCC 2013
Climate change – total	Global Warming Potential total (GWP-total)	kg CO_2 equivalents (GWP100)	Baseline model of 100 years of the IPCC based on IPCC 2013
Ozone depletion	Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 equivalents	Steady-state ODPs, WMO 2014
Acidification	Acidification potential, Accumulated Exceedance (AP)	mol H+ eq.	Accumulated Exceedance, Seppälä et al. 2006, Posch et al., 2008
Eutrophication – aquatic freshwater	Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP – freshwater)	kg PO_4^{3}- equivalents	CML (v4.1)
Eutrophication – aquatic freshwater	Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP – freshwater)	kg P equivalent	EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe[9]
Eutrophication – aquatic marine	Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP – marine)	kg N equivalent	EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe
Eutrophication – terrestrial	Eutrophication potential, Accumulated Exceedance (EP – terrestrial)	mol N equivalent	Accumulated Exceedance, Seppälä et al. 2006, Posch et al.
Photochemical ozone formation	Formation potential of tropospheric ozone (POCP)	kg NMVOC equivalents	LOTOS-EUROS, Van Zelm et al., 2008, as applied in ReCiPe
Depletion of abiotic resources – minerals and metals*	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	kg Sb equivalents	CML (v4.1)
Depletion of abiotic resources – fossil fuels*	Abiotic depletion potential for fossil resources (ADP-fossil)	MJ net calorific value	CML (v4.1)
Water Depletion Potential*	WDP	m^3 equivalent deprived	Available Water Remaining (AWARE) Boulay et al., 2016

[9] EN 15804:2012+A2:2019 specifies that the unit for the indicator for Eutrophication aquatic freshwater shall be kg PO43- eq, although the reference given ("EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe") uses the unit kg P eq. This is likely a typographical error in EN 15804+A2, which is expected to be corrected in a future revision. Until this has been corrected, results for Eutrophication aquatic freshwater shall be given in both kg PO4 eq and kg P eq. in the EPD.

TABLE 8 LIFE CYCLE IMPACT, RESOURCE AND WASTE ASSESSMENT CATEGORIES, MEASUREMENTS AND METHODS (CONT)

Impact Category	Indicator/Abbreviation	Measurement Unit	Assessment Method and Implementation
Resource use			
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ, net calorific value	ecoinvent version 3.6 and expanded by PRé Consultants[10]
Use of renewable primary energy resources used as raw materials	PERM	MJ, net calorific value	Manual for direct inputs[11]
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PERT	MJ, net calorific value	ecoinvent version 3.6 and expanded by PRé Consultants
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ, net calorific value	ecoinvent version 3.6 and expanded by PRé Consultants
Use of non- renewable primary energy resources used as raw materials	PENRM	MJ, net calorific value	Manual for direct inputs[12]
Total use of non- renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PENRT	MJ, net calorific value	ecoinvent version 3.6 and expanded by PRé Consultants[13]
Use of secondary material	SM	Kg	Manual for direct inputs
Use of renewable secondary fuels	RSF	MJ, net calorific value	Manual for direct inputs
Use of non-renewable secondary fuels	NRSF	MJ, net calorific value	Manual for direct inputs
Use of net fresh water	FW	m3	ReCiPe 2016

[10] Method to calculate Cumulative Energy Demand (CED), based on the method published by ecoinvent version 2.0 and expanded by PRé Consultants for raw materials available in the SimaPro database.
[11] Calculated based on the lower heating value of renewable raw materials.
[12] Calculated based on the lower heating value of non-renewable raw materials.
[13] Calculated as sum of Non-renewable, fossil, Non-renewable, nuclear and Non-renewable, biomass.

TABLE 8: LIFE CYCLE IMPACT, RESOURCE AND WASTE ASSESSMENT CATEGORIES, MEASUREMENTS AND METHODS (CONT)

Impact Category	Indicator/Abbreviation	Measurement Unit	Assessment Method and Implementation
Waste categories			
Hazardous waste disposed	HWD	Kg	EDIP 2003 (v1.05)
Non-hazardous waste disposed	NHWD	Kg	EDIP 2003 (v1.05)[14]
Radioactive waste disposed/ stored	RWD	Kg	EDIP 2003 (v1.05)
Additional environmental impact indicators			
Global warming potential, excluding biogenic uptake, emissions and storage	GWP-GHG	Kg CO2 equivalents (GWP100)	CML (v4.1)
Particulate matter emissions	Potential incidence of disease due to PM	Disease incidence	SETAC-UNEP, Fantke et al. 2016
Ionising radiation – human health**	emissions (PM)	kBq U-235 eq	Human Health Effect model
Eco-toxicity (freshwater)*	Potential Human exposure efficiency	CTUe	USEtox
Human toxicity – cancer effects*	relative to U235 (IRP)	CTUh	USEtox
Human toxicity – non cancer effects*	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	CTUh	USEtox
Land use related impacts / soil quality*	Potential Comparative Toxic Unit for humans (HTP-c)	dimensionless	Soil quality index (LANCA®)
Environmental information describing output flows			
Components for re-use		Kg	
Materials for recycling		Kg	
Materials for energy recovery		Kg	
Exported energy		MJ per energy carrier	

[14] Calculated as sum of Bulk waste and Slags/ash.
*Disclaimer – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.
**Disclaimer – 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

Environmental Information for Hardie® Soffit Panels HZ10® / Hardie® Shingle HZ10®

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	5.11E+00	8.39E-01	1.71E+00	-8.81E-01	1.11E+00	1.14E-01	2.73E-02	0.00E+00	8.28E-02
GWP-biogenic	kg CO_2 eq.	-1.36E+00	1.75E-03	1.87E-01	0.00E+00	3.92E-03	6.35E-04	1.05E-05	0.00E+00	9.08E-04
GWP-luluc	kg CO_2 eq.	1.99E-03	3.42E-04	1.09E-03	0.00E+00	8.73E-04	5.90E-05	9.79E-06	0.00E+00	3.73E-05
GWP-total	kg CO_2 eq.	3.75E+00	8.41E-01	1.90E+00	-8.81E-01	1.11E+00	1.15E-01	2.73E-02	0.00E+00	8.37E-02
ODP	kg CFC 11 eq.	3.81E-07	1.85E-07	1.52E-07	0.00E+00	1.02E-07	7.41E-09	5.92E-09	0.00E+00	2.57E-08
AP	mol H+ eq.	1.74E-02	3.47E-03	1.05E-02	0.00E+00	9.37E-03	3.83E-04	1.13E-04	0.00E+00	7.07E-04
EP-freshwater	kg PO43- eq.	4.99E-03	5.51E-04	3.29E-03	0.00E+00	2.07E-03	3.28E-04	2.08E-05	0.00E+00	1.76E-04
EP-freshwater	kg P eq.	1.13E-03	6.31E-05	7.75E-04	0.00E+00	4.31E-04	9.79E-05	2.29E-06	0.00E+00	2.53E-05
EP-marine	kg N eq.	4.19E-03	1.02E-03	1.71E-03	0.00E+00	1.23E-03	7.10E-05	3.33E-05	0.00E+00	2.42E-04
EP-terrestrial	mol N eq.	4.35E-02	1.12E-02	1.71E-02	0.00E+00	1.23E-02	5.84E-04	3.64E-04	0.00E+00	2.64E-03
POCP	kg NMVOC eq.	1.10E-02	2.77E-03	5.40E-03	0.00E+00	4.25E-03	1.67E-04	1.11E-04	0.00E+00	7.62E-04
ADP-minerals&metals*	kg Sb eq.	1.92E-05	2.86E-06	4.08E-05	0.00E+00	4.72E-05	2.88E-07	7.17E-07	0.00E+00	8.84E-07
ADP-fossil*	MJ	5.53E+01	1.24E+01	2.33E+01	0.00E+00	1.68E+01	1.79E+00	4.02E-01	0.00E+00	1.95E+00
WDP*	m^3	5.69E+00	4.15E-02	5.00E-01	0.00E+00	7.22E-01	2.02E-02	1.30E-03	0.00E+00	8.41E-02
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	2.95E+01	1.42E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	4.49E-03	0.00E+00	3.18E-02
PERM	MJ	1.99E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	4.94E+01	1.42E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	4.49E-03	0.00E+00	3.18E-02
PENRE	MJ	5.97E+01	1.31E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	4.27E-01	0.00E+00	2.07E+00
PENRM	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
PENRT	MJ	5.97E+01	1.31E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	4.27E-01	0.00E+00	2.07E+00
SM	kg	2.21E+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
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
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
FW	m^3	2.51E-02	6.17E-04	6.62E-03	0.00E+00	8.89E-03	2.94E-04	1.92E-05	0.00E+00	1.18E-03

Environmental Information for Hardie® Soffit Panels HZ10® / Hardie® Shingle HZ10® (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	1.43E-04	3.22E-05	2.27E-05	0.00E+00	1.91E-05	2.04E-07	1.06E-06	0.00E+00	2.98E-06
NHWD	kg	1.30E+00	6.29E-01	1.30E+00	0.00E+00	4.00E-01	6.07E-03	1.90E-02	0.00E+00	7.87E+00
RWD	kg	1.44E-04	8.02E-05	8.87E-05	0.00E+00	4.63E-05	8.63E-06	2.64E-06	0.00E+00	1.16E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	4.97E+00	8.29E-01	1.66E+00	-8.81E-01	1.06E+00	1.12E-01	2.69E-02	0.00E+00	8.06E-02
Particulate matter	disease incidence	2.46E-07	5.77E-08	8.75E-08	0.00E+00	6.61E-08	1.87E-09	1.88E-09	0.00E+00	1.37E-08
Ionising radiation - human health**	kBq U-235 eq	3.21E-01	5.64E-02	2.28E-01	0.00E+00	9.28E-02	3.72E-02	1.87E-03	0.00E+00	9.13E-03
Eco-toxicity (freshwater)*	CTUe	7.32E+01	1.07E+01	4.67E+01	0.00E+00	2.91E+01	1.60E+00	3.54E-01	0.00E+00	1.56E+00
Human toxicity potential - cancer effects*	CTUh	2.80E-09	3.16E-10	8.33E-09	0.00E+00	1.53E-09	2.54E-11	9.11E-12	0.00E+00	5.22E-11
Human toxicity potential - non cancer effects*	CTUh	5.73E-08	1.03E-08	3.97E-08	0.00E+00	3.09E-08	7.68E-10	3.55E-10	0.00E+00	1.07E-09
Soil quality*	dimensionless	1.32E+02	8.71E+00	7.34E+00	0.00E+00	5.49E+00	2.93E-01	2.71E-01	0.00E+00	4.65E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

* Disclaimer: 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.
**Disclaimer – 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

Environmental Information for Hardie® Plank HZ10® / Hardie® Panel HZ10® / Hardie® Architectural Panel HZ10®

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	6.84E+00	1.12E+00	1.71E+00	-1.34E+00	1.11E+00	1.14E-01	3.40E-02	0.00E+00	1.03E-01
GWP-biogenic	kg CO_2 eq.	-1.94E+00	2.34E-03	1.87E-01	0.00E+00	3.92E-03	6.35E-04	1.31E-05	0.00E+00	1.13E-03
GWP-luluc	kg CO_2 eq.	2.73E-03	4.58E-04	1.09E-03	0.00E+00	8.73E-04	5.90E-05	1.22E-05	0.00E+00	4.65E-05
GWP-total	kg CO_2 eq.	4.90E+00	1.13E+00	1.90E+00	-1.34E+00	1.11E+00	1.15E-01	3.40E-02	0.00E+00	1.04E-01
ODP	kg CFC 11 eq.	4.84E-07	2.47E-07	1.52E-07	0.00E+00	1.02E-07	7.41E-09	7.38E-09	0.00E+00	3.20E-08
AP	mol H+ eq.	2.24E-02	4.64E-03	1.05E-02	0.00E+00	9.37E-03	3.83E-04	1.41E-04	0.00E+00	8.82E-04
EP-freshwater	kg PO43- eq.	6.22E-03	7.37E-04	3.29E-03	0.00E+00	2.07E-03	3.28E-04	2.59E-05	0.00E+00	2.20E-04
EP-freshwater	kg P eq.	1.37E-03	8.43E-05	7.75E-04	0.00E+00	4.31E-04	9.79E-05	2.85E-06	0.00E+00	3.15E-05
EP-marine	kg N eq.	5.60E-03	1.37E-03	1.71E-03	0.00E+00	1.23E-03	7.10E-05	4.15E-05	0.00E+00	3.02E-04
EP-terrestrial	mol N eq.	5.80E-02	1.50E-02	1.71E-02	0.00E+00	1.23E-02	5.84E-04	4.54E-04	0.00E+00	3.29E-03
POCP	kg NMVOC eq.	1.45E-02	3.71E-03	5.40E-03	0.00E+00	4.25E-03	1.67E-04	1.38E-04	0.00E+00	9.51E-04
ADP-minerals&metals*	kg Sb eq.	2.67E-05	3.82E-06	4.08E-05	0.00E+00	4.72E-05	2.88E-07	8.94E-07	0.00E+00	1.10E-06
ADP-fossil*	MJ	6.72E+01	1.65E+01	2.33E+01	0.00E+00	1.68E+01	1.79E+00	5.01E-01	0.00E+00	2.43E+00
WDP*	m^3	6.23E+00	5.55E-02	5.00E-01	0.00E+00	7.22E-01	2.02E-02	1.62E-03	0.00E+00	1.05E-01
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	4.24E+01	1.91E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	5.59E-03	0.00E+00	3.96E-02
PERM	MJ	2.94E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	7.18E+01	1.91E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	5.59E-03	0.00E+00	3.96E-02
PENRE	MJ	7.25E+01	1.76E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	5.32E-01	0.00E+00	2.58E+00
PENRM	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
PENRT	MJ	7.25E+01	1.76E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	5.32E-01	0.00E+00	2.58E+00
SM	kg	3.37E+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
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
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
FW	m^3	3.23E-02	8.25E-04	6.62E-03	0.00E+00	8.89E-03	2.94E-04	2.39E-05	0.00E+00	1.47E-03

Environmental Information for Hardie® Plank HZ10® / Hardie® Panel HZ10® / Hardie® Architectural Panel HZ10® (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	2.01E-04	4.31E-05	2.27E-05	0.00E+00	1.91E-05	2.04E-07	1.32E-06	0.00E+00	3.72E-06
NHWD	kg	1.66E+00	8.41E-01	1.30E+00	0.00E+00	4.00E-01	6.07E-03	2.37E-02	0.00E+00	9.82E+00
RWD	kg	1.75E-04	1.07E-04	8.87E-05	0.00E+00	4.63E-05	8.63E-06	3.29E-06	0.00E+00	1.45E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	6.64E+00	1.11E+00	1.66E+00	-1.34E+00	1.06E+00	1.12E-01	3.36E-02	0.00E+00	1.01E-01
Particulate matter	disease incidence	3.28E-07	7.72E-08	8.75E-08	0.00E+00	6.61E-08	1.87E-09	2.34E-09	0.00E+00	1.71E-08
Ionising radiation - human health**	kBq U-235 eq	3.56E-01	7.55E-02	2.28E-01	0.00E+00	9.28E-02	3.72E-02	2.33E-03	0.00E+00	1.14E-02
Eco-toxicity (freshwater)*	CTUe	9.87E+01	1.44E+01	4.67E+01	0.00E+00	2.91E+01	1.60E+00	4.41E-01	0.00E+00	1.95E+00
Human toxicity potential - cancer effects*	CTUh	3.58E-09	4.22E-10	8.33E-09	0.00E+00	1.53E-09	2.54E-11	1.14E-11	0.00E+00	6.51E-11
Human toxicity potential - non cancer effects*	CTUh	7.55E-08	1.38E-08	3.97E-08	0.00E+00	3.09E-08	7.68E-10	4.42E-10	0.00E+00	1.34E-09
Soil quality*	dimensionless	1.86E+02	1.17E+01	7.34E+00	0.00E+00	5.49E+00	2.93E-01	3.38E-01	0.00E+00	5.80E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

* Disclaimer: 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.
**Disclaimer – 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

Environmental Information for Hardie® Shingle HZ5®

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	5.98E+00	1.02E+00	1.71E+00	-1.19E+00	1.11E+00	1.14E-01	2.73E-02	0.00E+00	8.28E-02
GWP-biogenic	kg CO_2 eq.	-1.56E+00	2.13E-03	1.87E-01	0.00E+00	3.92E-03	6.35E-04	1.05E-05	0.00E+00	9.08E-04
GWP-luluc	kg CO_2 eq.	2.26E-03	4.17E-04	1.09E-03	0.00E+00	8.73E-04	5.90E-05	9.80E-06	0.00E+00	3.73E-05
GWP-total	kg CO_2 eq.	4.43E+00	1.03E+00	1.90E+00	-1.19E+00	1.11E+00	1.15E-01	2.73E-02	0.00E+00	8.38E-02
ODP	kg CFC 11 eq.	4.17E-07	2.26E-07	1.52E-07	0.00E+00	1.02E-07	7.41E-09	5.92E-09	0.00E+00	2.57E-08
AP	mol H+ eq.	1.98E-02	4.23E-03	1.05E-02	0.00E+00	9.37E-03	3.83E-04	1.13E-04	0.00E+00	7.08E-04
EP-freshwater	kg PO43- eq.	5.16E-03	6.72E-04	3.28E-03	0.00E+00	2.07E-03	3.28E-04	2.08E-05	0.00E+00	1.76E-04
EP-freshwater	kg P eq.	1.13E-03	7.69E-05	7.75E-04	0.00E+00	4.31E-04	9.79E-05	2.29E-06	0.00E+00	2.53E-05
EP-marine	kg N eq.	4.69E-03	1.25E-03	1.70E-03	0.00E+00	1.23E-03	7.10E-05	3.33E-05	0.00E+00	2.42E-04
EP-terrestrial	mol N eq.	5.02E-02	1.36E-02	1.70E-02	0.00E+00	1.23E-02	5.84E-04	3.64E-04	0.00E+00	2.64E-03
POCP	kg NMVOC eq.	1.25E-02	3.38E-03	5.39E-03	0.00E+00	4.25E-03	1.67E-04	1.11E-04	0.00E+00	7.63E-04
ADP-minerals&metals*	kg Sb eq.	2.36E-05	3.49E-06	4.08E-05	0.00E+00	4.72E-05	2.88E-07	7.17E-07	0.00E+00	8.85E-07
ADP-fossil*	MJ	6.34E+01	1.51E+01	2.33E+01	0.00E+00	1.68E+01	1.79E+00	4.02E-01	0.00E+00	1.95E+00
WDP*	m^3	5.84E+00	5.06E-02	4.99E-01	0.00E+00	7.22E-01	2.02E-02	1.30E-03	0.00E+00	8.42E-02
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	3.40E+01	1.74E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	4.49E-03	0.00E+00	3.18E-02
PERM	MJ	2.37E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	5.77E+01	1.74E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	4.49E-03	0.00E+00	3.18E-02
PENRE	MJ	6.80E+01	1.60E+01	2.48E+01	0.00E+00	1.80E+01	1.90E+00	4.27E-01	0.00E+00	2.07E+00
PENRM	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
PENRT	MJ	6.80E+01	1.60E+01	2.48E+01	0.00E+00	1.80E+01	1.90E+00	4.27E-01	0.00E+00	2.07E+00
SM	kg	2.98E+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
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
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
FW	m^3	2.70E-02	7.52E-04	6.60E-03	0.00E+00	8.89E-03	2.94E-04	1.92E-05	0.00E+00	1.18E-03

Environmental Information for Hardie® Shingle HZ5® (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	1.63E-04	3.93E-05	2.26E-05	0.00E+00	1.91E-05	2.04E-07	1.06E-06	0.00E+00	2.98E-06
NHWD	kg	1.41E+00	7.66E-01	1.19E+00	0.00E+00	4.00E-01	6.07E-03	1.90E-02	0.00E+00	7.88E+00
RWD	kg	1.94E-04	9.78E-05	8.86E-05	0.00E+00	4.63E-05	8.63E-06	2.64E-06	0.00E+00	1.16E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	5.84E+00	1.01E+00	1.66E+00	-1.19E+00	1.06E+00	1.12E-01	2.70E-02	0.00E+00	8.07E-02
Particulate matter	disease incidence	2.70E-07	7.04E-08	8.73E-08	0.00E+00	6.61E-08	1.87E-09	1.88E-09	0.00E+00	1.37E-08
Ionising radiation - human health**	kBq U-235 eq	5.10E-01	6.88E-02	2.28E-01	0.00E+00	9.28E-02	3.72E-02	1.87E-03	0.00E+00	9.13E-03
Eco-toxicity (freshwater)*	CTUe	9.03E+01	1.31E+01	4.67E+01	0.00E+00	2.91E+01	1.60E+00	3.54E-01	0.00E+00	1.57E+00
Human toxicity potential - cancer effects*	CTUh	3.00E-09	3.85E-10	8.33E-09	0.00E+00	1.53E-09	2.54E-11	9.12E-12	0.00E+00	5.23E-11
Human toxicity potential - non cancer effects*	CTUh	6.35E-08	1.26E-08	3.97E-08	0.00E+00	3.09E-08	7.68E-10	3.55E-10	0.00E+00	1.07E-09
Soil quality*	dimensionless	1.53E+02	1.06E+01	7.27E+00	0.00E+00	5.49E+00	2.93E-01	2.72E-01	0.00E+00	4.66E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

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Environmental Information for Hardie® Plank HZ5® / Hardie® Panel HZ5® / Hardie® Architectural Panel HZ5®

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	7.63E+00	1.51E+00	1.71E+00	-1.46E+00	1.11E+00	1.14E-01	3.40E-02	0.00E+00	1.03E-01
GWP-biogenic	kg CO_2 eq.	-1.93E+00	3.14E-03	1.87E-01	0.00E+00	3.92E-03	6.35E-04	1.31E-05	0.00E+00	1.13E-03
GWP-luluc	kg CO_2 eq.	2.78E-03	6.16E-04	1.09E-03	0.00E+00	8.73E-04	5.90E-05	1.22E-05	0.00E+00	4.64E-05
GWP-total	kg CO_2 eq.	5.70E+00	1.51E+00	1.90E+00	-1.46E+00	1.11E+00	1.15E-01	3.40E-02	0.00E+00	1.04E-01
ODP	kg CFC 11 eq.	5.19E-07	3.33E-07	1.52E-07	0.00E+00	1.02E-07	7.41E-09	7.37E-09	0.00E+00	3.20E-08
AP	mol H+ eq.	2.47E-02	6.25E-03	1.05E-02	0.00E+00	9.37E-03	3.83E-04	1.41E-04	0.00E+00	8.81E-04
EP-freshwater	kg PO43- eq.	6.49E-03	9.92E-04	3.29E-03	0.00E+00	2.07E-03	3.28E-04	2.59E-05	0.00E+00	2.19E-04
EP-freshwater	kg P eq.	1.40E-03	1.14E-04	7.75E-04	0.00E+00	4.31E-04	9.79E-05	2.85E-06	0.00E+00	3.15E-05
EP-marine	kg N eq.	6.07E-03	1.84E-03	1.71E-03	0.00E+00	1.23E-03	7.10E-05	4.15E-05	0.00E+00	3.02E-04
EP-terrestrial	mol N eq.	6.26E-02	2.01E-02	1.71E-02	0.00E+00	1.23E-02	5.84E-04	4.53E-04	0.00E+00	3.29E-03
POCP	kg NMVOC eq.	1.56E-02	4.99E-03	5.40E-03	0.00E+00	4.25E-03	1.67E-04	1.38E-04	0.00E+00	9.50E-04
ADP-minerals&metals*	kg Sb eq.	2.87E-05	5.15E-06	4.08E-05	0.00E+00	4.72E-05	2.88E-07	8.93E-07	0.00E+00	1.10E-06
ADP-fossil*	MJ	7.75E+01	2.23E+01	2.33E+01	0.00E+00	1.68E+01	1.79E+00	5.00E-01	0.00E+00	2.42E+00
WDP*	m^3	6.38E+00	7.47E-02	5.00E-01	0.00E+00	7.22E-01	2.02E-02	1.62E-03	0.00E+00	1.05E-01
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	4.23E+01	2.56E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	5.59E-03	0.00E+00	3.96E-02
PERM	MJ	2.94E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	7.17E+01	2.56E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	5.59E-03	0.00E+00	3.96E-02
PENRE	MJ	8.33E+01	2.36E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	5.31E-01	0.00E+00	2.58E+00
PENRM	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
PENRT	MJ	8.33E+01	2.36E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	5.31E-01	0.00E+00	2.58E+00
SM	kg	3.66E+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
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
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
FW	m^3	3.44E-02	1.11E-03	6.62E-03	0.00E+00	8.89E-03	2.94E-04	2.39E-05	0.00E+00	1.47E-03

Environmental Information for Hardie® Plank HZ5® / Hardie® Panel HZ5® / Hardie® Architectural Panel HZ5® (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	2.04E-04	5.80E-05	2.27E-05	0.00E+00	1.91E-05	2.04E-07	1.32E-06	0.00E+00	3.71E-06
NHWD	kg	2.28E+00	1.13E+00	1.30E+00	0.00E+00	4.00E-01	6.07E-03	2.37E-02	0.00E+00	9.81E+00
RWD	kg	2.38E-04	1.44E-04	8.87E-05	0.00E+00	4.63E-05	8.63E-06	3.29E-06	0.00E+00	1.45E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	7.40E+00	1.49E+00	1.66E+00	-1.46E+00	1.06E+00	1.12E-01	3.36E-02	0.00E+00	1.00E-01
Particulate matter	disease incidence	3.36E-07	1.04E-07	8.75E-08	0.00E+00	6.61E-08	1.87E-09	2.34E-09	0.00E+00	1.71E-08
Ionising radiation - human health**	kBq U-235 eq	6.14E-01	1.02E-01	2.28E-01	0.00E+00	9.28E-02	3.72E-02	2.33E-03	0.00E+00	1.14E-02
Eco-toxicity (freshwater)*	CTUe	1.11E+02	1.94E+01	4.67E+01	0.00E+00	2.91E+01	1.60E+00	4.41E-01	0.00E+00	1.95E+00
Human toxicity potential - cancer effects*	CTUh	3.80E-09	5.68E-10	8.33E-09	0.00E+00	1.53E-09	2.54E-11	1.14E-11	0.00E+00	6.51E-11
Human toxicity potential - non cancer effects*	CTUh	8.00E-08	1.85E-08	3.97E-08	0.00E+00	3.09E-08	7.68E-10	4.42E-10	0.00E+00	1.33E-09
Soil quality*	dimensionless	1.88E+02	1.57E+01	7.34E+00	0.00E+00	5.49E+00	2.93E-01	3.38E-01	0.00E+00	5.80E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

* Disclaimer: 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.
**Disclaimer – 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

Environmental Information for Hardie® Backer Board 0.42”

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	7.05E+00	1.21E+00	1.71E+00	-1.06E+00	1.11E+00	1.14E-01	3.69E-02	0.00E+00	1.12E-01
GWP-biogenic	kg CO_2 eq.	-1.85E+00	2.52E-03	1.87E-01	0.00E+00	3.92E-03	6.35E-04	1.42E-05	0.00E+00	1.23E-03
GWP-luluc	kg CO_2 eq.	2.67E-03	4.95E-04	1.09E-03	0.00E+00	8.73E-04	5.90E-05	1.32E-05	0.00E+00	5.04E-05
GWP-total	kg CO_2 eq.	5.20E+00	1.22E+00	1.90E+00	-1.06E+00	1.11E+00	1.15E-01	3.69E-02	0.00E+00	1.13E-01
ODP	kg CFC 11 eq.	5.20E-07	2.67E-07	1.52E-07	0.00E+00	1.02E-07	7.41E-09	8.00E-09	0.00E+00	3.47E-08
AP	mol H+ eq.	2.32E-02	5.02E-03	1.05E-02	0.00E+00	9.37E-03	3.83E-04	1.53E-04	0.00E+00	9.57E-04
EP-freshwater	kg PO43- eq.	6.96E-03	7.97E-04	3.29E-03	0.00E+00	2.07E-03	3.28E-04	2.81E-05	0.00E+00	2.38E-04
EP-freshwater	kg P eq.	1.61E-03	9.11E-05	7.75E-04	0.00E+00	4.31E-04	9.79E-05	3.10E-06	0.00E+00	3.42E-05
EP-marine	kg N eq.	5.63E-03	1.48E-03	1.71E-03	0.00E+00	1.23E-03	7.10E-05	4.51E-05	0.00E+00	3.28E-04
EP-terrestrial	mol N eq.	5.79E-02	1.62E-02	1.71E-02	0.00E+00	1.23E-02	5.84E-04	4.92E-04	0.00E+00	3.57E-03
POCP	kg NMVOC eq.	1.46E-02	4.01E-03	5.40E-03	0.00E+00	4.25E-03	1.67E-04	1.50E-04	0.00E+00	1.03E-03
ADP-minerals&metals*	kg Sb eq.	2.55E-05	4.13E-06	4.08E-05	0.00E+00	4.72E-05	2.88E-07	9.69E-07	0.00E+00	1.20E-06
ADP-fossil*	MJ	7.56E+01	1.79E+01	2.33E+01	0.00E+00	1.68E+01	1.79E+00	5.43E-01	0.00E+00	2.63E+00
WDP*	m^3	6.49E+00	6.00E-02	5.00E-01	0.00E+00	7.22E-01	2.02E-02	1.76E-03	0.00E+00	1.14E-01
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	4.06E+01	2.06E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	6.07E-03	0.00E+00	4.30E-02
PERM	MJ	2.71E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	6.76E+01	2.06E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	6.07E-03	0.00E+00	4.30E-02
PENRE	MJ	8.15E+01	1.90E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	5.77E-01	0.00E+00	2.80E+00
PENRM	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
PENRT	MJ	8.15E+01	1.90E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	5.77E-01	0.00E+00	2.80E+00
SM	kg	3.00E+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
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
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
FW	m^3	3.60E-02	8.92E-04	6.62E-03	0.00E+00	8.89E-03	2.94E-04	2.59E-05	0.00E+00	1.60E-03

Environmental Information for Hardie® Backer Board 0.42” (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	1.93E-04	4.65E-05	2.27E-05	0.00E+00	1.91E-05	2.04E-07	1.43E-06	0.00E+00	4.03E-06
NHWD	kg	1.85E+00	9.09E-01	1.35E+00	0.00E+00	4.00E-01	6.07E-03	2.57E-02	0.00E+00	1.06E+01
RWD	kg	2.03E-04	1.16E-04	8.88E-05	0.00E+00	4.63E-05	8.63E-06	3.57E-06	0.00E+00	1.57E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	6.85E+00	1.20E+00	1.66E+00	-1.06E+00	1.06E+00	1.12E-01	3.64E-02	0.00E+00	1.09E-01
Particulate matter	disease incidence	3.24E-07	8.34E-08	8.76E-08	0.00E+00	6.61E-08	1.87E-09	2.54E-09	0.00E+00	1.86E-08
Ionising radiation - human health**	kBq U-235 eq	4.82E-01	8.15E-02	2.28E-01	0.00E+00	9.28E-02	3.72E-02	2.53E-03	0.00E+00	1.23E-02
Eco-toxicity (freshwater)*	CTUe	1.01E+02	1.55E+01	4.67E+01	0.00E+00	2.91E+01	1.60E+00	4.79E-01	0.00E+00	2.12E+00
Human toxicity potential - cancer effects*	CTUh	3.78E-09	4.56E-10	8.33E-09	0.00E+00	1.53E-09	2.54E-11	1.23E-11	0.00E+00	7.06E-11
Human toxicity potential - non cancer effects*	CTUh	7.75E-08	1.49E-08	3.97E-08	0.00E+00	3.09E-08	7.68E-10	4.80E-10	0.00E+00	1.45E-09
Soil quality*	dimensionless	1.79E+02	1.26E+01	7.36E+00	0.00E+00	5.49E+00	2.93E-01	3.67E-01	0.00E+00	6.30E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

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Environmental Information for Hardie® Reveal® Panel

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	1.03E+01	2.26E+00	1.71E+00	-2.04E+00	1.11E+00	1.14E-01	4.74E-02	0.00E+00	1.44E-01
GWP-biogenic	kg CO_2 eq.	-2.70E+00	4.70E-03	1.87E-01	0.00E+00	3.92E-03	6.35E-04	1.82E-05	0.00E+00	1.58E-03
GWP-luluc	kg CO_2 eq.	3.87E-03	9.21E-04	1.09E-03	0.00E+00	8.73E-04	5.90E-05	1.70E-05	0.00E+00	6.48E-05
GWP-total	kg CO_2 eq.	7.58E+00	2.26E+00	1.90E+00	-2.04E+00	1.11E+00	1.15E-01	4.74E-02	0.00E+00	1.45E-01
ODP	kg CFC 11 eq.	7.28E-07	4.98E-07	1.53E-07	0.00E+00	1.02E-07	7.41E-09	1.03E-08	0.00E+00	4.46E-08
AP	mol H+ eq.	3.35E-02	9.34E-03	1.05E-02	0.00E+00	9.37E-03	3.83E-04	1.97E-04	0.00E+00	1.23E-03
EP-freshwater	kg PO43- eq.	1.04E-02	1.48E-03	3.29E-03	0.00E+00	2.07E-03	3.28E-04	3.61E-05	0.00E+00	3.06E-04
EP-freshwater	kg P eq.	2.42E-03	1.70E-04	7.76E-04	0.00E+00	4.31E-04	9.79E-05	3.98E-06	0.00E+00	4.40E-05
EP-marine	kg N eq.	8.27E-03	2.75E-03	1.71E-03	0.00E+00	1.23E-03	7.10E-05	5.79E-05	0.00E+00	4.21E-04
EP-terrestrial	mol N eq.	8.79E-02	3.01E-02	1.72E-02	0.00E+00	1.23E-02	5.84E-04	6.33E-04	0.00E+00	4.59E-03
POCP	kg NMVOC eq.	2.17E-02	7.46E-03	5.42E-03	0.00E+00	4.25E-03	1.67E-04	1.93E-04	0.00E+00	1.33E-03
ADP-minerals&metals*	kg Sb eq.	3.99E-05	7.69E-06	4.09E-05	0.00E+00	4.72E-05	2.88E-07	1.25E-06	0.00E+00	1.54E-06
ADP-fossil*	MJ	1.05E+02	3.33E+01	2.34E+01	0.00E+00	1.68E+01	1.79E+00	6.98E-01	0.00E+00	3.38E+00
WDP*	m^3	7.66E+00	1.12E-01	5.02E-01	0.00E+00	7.22E-01	2.02E-02	2.26E-03	0.00E+00	1.46E-01
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	6.17E+01	3.83E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	7.80E-03	0.00E+00	5.53E-02
PERM	MJ	4.11E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.03E+02	3.83E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	7.80E-03	0.00E+00	5.53E-02
PENRE	MJ	1.13E+02	3.53E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	7.42E-01	0.00E+00	3.59E+00
PENRM	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
PENRT	MJ	1.13E+02	3.53E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	7.42E-01	0.00E+00	3.59E+00
SM	kg	5.12E+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
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
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
FW	m^3	5.19E-02	1.66E-03	6.65E-03	0.00E+00	8.89E-03	2.94E-04	3.33E-05	0.00E+00	2.05E-03

Environmental Information for Hardie® Reveal® Panel (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	2.84E-04	8.66E-05	2.28E-05	0.00E+00	1.91E-05	2.04E-07	1.84E-06	0.00E+00	5.18E-06
NHWD	kg	3.06E+00	1.69E+00	1.52E+00	0.00E+00	4.00E-01	6.07E-03	3.30E-02	0.00E+00	1.37E+01
RWD	kg	3.05E-04	2.16E-04	8.90E-05	0.00E+00	4.63E-05	8.63E-06	4.59E-06	0.00E+00	2.02E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	1.01E+01	2.23E+00	1.66E+00	-2.04E+00	1.06E+00	1.12E-01	4.68E-02	0.00E+00	1.40E-01
Particulate matter	disease incidence	4.72E-07	1.55E-07	8.79E-08	0.00E+00	6.61E-08	1.87E-09	3.27E-09	0.00E+00	2.39E-08
Ionising radiation - human health**	kBq U-235 eq	7.38E-01	1.52E-01	2.28E-01	0.00E+00	9.28E-02	3.72E-02	3.25E-03	0.00E+00	1.59E-02
Eco-toxicity (freshwater)*	CTUe	1.54E+02	2.89E+01	4.67E+01	0.00E+00	2.91E+01	1.60E+00	6.15E-01	0.00E+00	2.72E+00
Human toxicity potential - cancer effects*	CTUh	5.15E-09	8.50E-10	8.33E-09	0.00E+00	1.53E-09	2.54E-11	1.58E-11	0.00E+00	9.08E-11
Human toxicity potential - non cancer effects*	CTUh	1.10E-07	2.77E-08	3.97E-08	0.00E+00	3.09E-08	7.68E-10	6.16E-10	0.00E+00	1.86E-09
Soil quality*	dimensionless	2.65E+02	2.34E+01	7.47E+00	0.00E+00	5.49E+00	2.93E-01	4.72E-01	0.00E+00	8.09E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

* Disclaimer: 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.
**Disclaimer – 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

Environmental Information for Hardie® Trim 5/4 HZ5®/HZ10®

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	2.44E+01	3.05E+00	1.72E+00	-4.10E+00	1.11E+00	1.14E-01	9.00E-02	0.00E+00	2.73E-01
GWP-biogenic	kg CO_2 eq.	-6.00E+00	6.35E-03	1.87E-01	0.00E+00	3.92E-03	6.35E-04	3.46E-05	0.00E+00	3.00E-03
GWP-luluc	kg CO_2 eq.	1.45E-02	1.24E-03	1.09E-03	0.00E+00	8.73E-04	5.90E-05	3.23E-05	0.00E+00	1.23E-04
GWP-total	kg CO_2 eq.	1.84E+01	3.06E+00	1.91E+00	-4.10E+00	1.11E+00	1.15E-01	9.01E-02	0.00E+00	2.76E-01
ODP	kg CFC 11 eq.	1.98E-06	6.72E-07	1.55E-07	0.00E+00	1.02E-07	7.41E-09	1.95E-08	0.00E+00	8.48E-08
AP	mol H+ eq.	1.10E-01	1.26E-02	1.06E-02	0.00E+00	9.37E-03	3.83E-04	3.74E-04	0.00E+00	2.34E-03
EP-freshwater	kg PO43- eq.	2.63E-02	2.00E-03	3.31E-03	0.00E+00	2.07E-03	3.28E-04	6.86E-05	0.00E+00	5.82E-04
EP-freshwater	kg P eq.	5.56E-03	2.29E-04	7.78E-04	0.00E+00	4.31E-04	9.79E-05	7.56E-06	0.00E+00	8.36E-05
EP-marine	kg N eq.	2.12E-02	3.72E-03	1.73E-03	0.00E+00	1.23E-03	7.10E-05	1.10E-04	0.00E+00	8.00E-04
EP-terrestrial	mol N eq.	2.36E-01	4.06E-02	1.74E-02	0.00E+00	1.23E-02	5.84E-04	1.20E-03	0.00E+00	8.71E-03
POCP	kg NMVOC eq.	5.48E-02	1.01E-02	5.49E-03	0.00E+00	4.25E-03	1.67E-04	3.66E-04	0.00E+00	2.52E-03
ADP-minerals&metals*	kg Sb eq.	2.70E-04	1.04E-05	4.09E-05	0.00E+00	4.72E-05	2.88E-07	2.37E-06	0.00E+00	2.92E-06
ADP-fossil*	MJ	2.30E+02	4.49E+01	2.36E+01	0.00E+00	1.68E+01	1.79E+00	1.33E+00	0.00E+00	6.43E+00
WDP*	m^3	1.49E+01	1.51E-01	5.10E-01	0.00E+00	7.22E-01	2.02E-02	4.29E-03	0.00E+00	2.78E-01
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	1.37E+02	5.18E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	1.48E-02	0.00E+00	1.05E-01
PERM	MJ	9.51E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	2.32E+02	5.18E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	1.48E-02	0.00E+00	1.05E-01
PENRE	MJ	2.48E+02	4.77E+01	2.51E+01	0.00E+00	1.80E+01	1.90E+00	1.41E+00	0.00E+00	6.83E+00
PENRM	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
PENRT	MJ	2.48E+02	4.77E+01	2.51E+01	0.00E+00	1.80E+01	1.90E+00	1.41E+00	0.00E+00	6.83E+00
SM	kg	1.03E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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
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
FW	m^3	1.46E-01	2.24E-03	6.76E-03	0.00E+00	8.89E-03	2.94E-04	6.34E-05	0.00E+00	3.90E-03

Environmental Information for Hardie® Trim 5/4 HZ5®/HZ10® (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	8.71E-04	1.17E-04	2.30E-05	0.00E+00	1.91E-05	2.04E-07	3.50E-06	0.00E+00	9.85E-06
NHWD	kg	4.74E+00	2.28E+00	2.22E+00	0.00E+00	4.00E-01	6.07E-03	6.27E-02	0.00E+00	2.60E+01
RWD	kg	6.17E-04	2.92E-04	9.01E-05	0.00E+00	4.63E-05	8.63E-06	8.72E-06	0.00E+00	3.84E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	2.38E+01	3.02E+00	1.67E+00	-4.10E+00	1.06E+00	1.12E-01	8.90E-02	0.00E+00	2.66E-01
Particulate matter	disease incidence	1.28E-06	2.10E-07	8.91E-08	0.00E+00	6.61E-08	1.87E-09	6.21E-09	0.00E+00	4.54E-08
Ionising radiation - human health**	kBq U-235 eq	1.20E+00	2.05E-01	2.29E-01	0.00E+00	9.28E-02	3.72E-02	6.18E-03	0.00E+00	3.02E-02
Eco-toxicity (freshwater)*	CTUe	4.75E+02	3.91E+01	4.69E+01	0.00E+00	2.91E+01	1.60E+00	1.17E+00	0.00E+00	5.17E+00
Human toxicity potential - cancer effects*	CTUh	1.72E-08	1.15E-09	8.34E-09	0.00E+00	1.53E-09	2.54E-11	3.01E-11	0.00E+00	1.73E-10
Human toxicity potential - non cancer effects*	CTUh	3.90E-07	3.74E-08	3.98E-08	0.00E+00	3.09E-08	7.68E-10	1.17E-09	0.00E+00	3.54E-09
Soil quality*	dimensionless	6.07E+02	3.17E+01	7.88E+00	0.00E+00	5.49E+00	2.93E-01	8.97E-01	0.00E+00	1.54E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

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**Disclaimer – 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

Environmental Information for Hardie® Trim 5/4 NT3®

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	2.50E+01	7.22E+00	1.72E+00	-3.66E+00	1.11E+00	1.14E-01	1.05E-01	0.00E+00	3.20E-01
GWP-biogenic	kg CO_2 eq.	-6.04E+00	1.50E-02	1.87E-01	0.00E+00	3.92E-03	6.35E-04	4.05E-05	0.00E+00	3.51E-03
GWP-luluc	kg CO_2 eq.	1.16E-02	2.95E-03	1.10E-03	0.00E+00	8.73E-04	5.90E-05	3.78E-05	0.00E+00	1.44E-04
GWP-total	kg CO_2 eq.	1.90E+01	7.24E+00	1.91E+00	-3.66E+00	1.11E+00	1.15E-01	1.05E-01	0.00E+00	3.23E-01
ODP	kg CFC 11 eq.	1.89E-06	1.59E-06	1.56E-07	0.00E+00	1.02E-07	7.41E-09	2.29E-08	0.00E+00	9.92E-08
AP	mol H+ eq.	9.70E-02	2.99E-02	1.06E-02	0.00E+00	9.37E-03	3.83E-04	4.38E-04	0.00E+00	2.73E-03
EP-freshwater	kg PO43- eq.	2.34E-02	4.75E-03	3.31E-03	0.00E+00	2.07E-03	3.28E-04	8.02E-05	0.00E+00	6.80E-04
EP-freshwater	kg P eq.	4.88E-03	5.43E-04	7.79E-04	0.00E+00	4.31E-04	9.79E-05	8.85E-06	0.00E+00	9.78E-05
EP-marine	kg N eq.	2.08E-02	8.81E-03	1.74E-03	0.00E+00	1.23E-03	7.10E-05	1.29E-04	0.00E+00	9.36E-04
EP-terrestrial	mol N eq.	2.16E-01	9.62E-02	1.75E-02	0.00E+00	1.23E-02	5.84E-04	1.41E-03	0.00E+00	1.02E-02
POCP	kg NMVOC eq.	5.22E-02	2.39E-02	5.51E-03	0.00E+00	4.25E-03	1.67E-04	4.29E-04	0.00E+00	2.95E-03
ADP-minerals&metals*	kg Sb eq.	1.74E-04	2.46E-05	4.10E-05	0.00E+00	4.72E-05	2.88E-07	2.77E-06	0.00E+00	3.42E-06
ADP-fossil*	MJ	2.60E+02	1.06E+02	2.36E+01	0.00E+00	1.68E+01	1.79E+00	1.55E+00	0.00E+00	7.52E+00
WDP*	m^3	1.41E+01	3.57E-01	5.12E-01	0.00E+00	7.22E-01	2.02E-02	5.02E-03	0.00E+00	3.25E-01
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	1.32E+02	1.23E+00	2.45E+00	0.00E+00	1.09E+00	1.54E-01	1.73E-02	0.00E+00	1.23E-01
PERM	MJ	9.19E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	2.24E+02	1.23E+00	2.45E+00	0.00E+00	1.09E+00	1.54E-01	1.73E-02	0.00E+00	1.23E-01
PENRE	MJ	2.79E+02	1.13E+02	2.52E+01	0.00E+00	1.80E+01	1.90E+00	1.65E+00	0.00E+00	7.99E+00
PENRM	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
PENRT	MJ	2.79E+02	1.13E+02	2.52E+01	0.00E+00	1.80E+01	1.90E+00	1.65E+00	0.00E+00	7.99E+00
SM	kg	9.18E+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
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
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
FW	m^3	1.37E-01	5.31E-03	6.79E-03	0.00E+00	8.89E-03	2.94E-04	7.41E-05	0.00E+00	4.56E-03

Environmental Information for Hardie® Trim 5/4 NT3® (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	7.60E-04	2.77E-04	2.31E-05	0.00E+00	1.91E-05	2.04E-07	4.09E-06	0.00E+00	1.15E-05
NHWD	kg	8.95E+00	5.41E+00	2.48E+00	0.00E+00	4.00E-01	6.07E-03	7.34E-02	0.00E+00	3.04E+01
RWD	kg	8.53E-04	6.91E-04	9.05E-05	0.00E+00	4.63E-05	8.63E-06	1.02E-05	0.00E+00	4.50E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	2.41E+01	7.14E+00	1.67E+00	-3.66E+00	1.06E+00	1.12E-01	1.04E-01	0.00E+00	3.12E-01
Particulate matter	disease incidence	1.18E-06	4.97E-07	8.95E-08	0.00E+00	6.61E-08	1.87E-09	7.26E-09	0.00E+00	5.31E-08
Ionising radiation - human health**	kBq U-235 eq	2.34E+00	4.86E-01	2.29E-01	0.00E+00	9.28E-02	3.72E-02	7.22E-03	0.00E+00	3.53E-02
Eco-toxicity (freshwater)*	CTUe	4.29E+02	9.26E+01	4.69E+01	0.00E+00	2.91E+01	1.60E+00	1.37E+00	0.00E+00	6.05E+00
Human toxicity potential - cancer effects*	CTUh	1.55E-08	2.72E-09	8.34E-09	0.00E+00	1.53E-09	2.54E-11	3.52E-11	0.00E+00	2.02E-10
Human toxicity potential - non cancer effects*	CTUh	3.30E-07	8.86E-08	3.99E-08	0.00E+00	3.09E-08	7.68E-10	1.37E-09	0.00E+00	4.14E-09
Soil quality*	dimensionless	5.97E+02	7.50E+01	8.03E+00	0.00E+00	5.49E+00	2.93E-01	1.05E+00	0.00E+00	1.80E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

* Disclaimer: 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.
**Disclaimer – 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

Environmental Information for Hardie® Trim 4/4 HZ5®/HZ10®

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	1.85E+01	2.32E+00	1.72E+00	-3.11E+00	1.11E+00	1.14E-01	6.84E-02	0.00E+00	2.73E-01
GWP-biogenic	kg CO_2 eq.	-4.56E+00	4.82E-03	1.87E-01	0.00E+00	3.92E-03	6.35E-04	2.63E-05	0.00E+00	3.00E-03
GWP-luluc	kg CO_2 eq.	1.10E-02	9.45E-04	1.09E-03	0.00E+00	8.73E-04	5.90E-05	2.46E-05	0.00E+00	1.23E-04
GWP-total	kg CO_2 eq.	1.40E+01	2.32E+00	1.91E+00	-3.11E+00	1.11E+00	1.15E-01	6.85E-02	0.00E+00	2.76E-01
ODP	kg CFC 11 eq.	1.50E-06	5.11E-07	1.55E-07	0.00E+00	1.02E-07	7.41E-09	1.49E-08	0.00E+00	8.48E-08
AP	mol H+ eq.	8.39E-02	9.59E-03	1.06E-02	0.00E+00	9.37E-03	3.83E-04	2.84E-04	0.00E+00	2.34E-03
EP-freshwater	kg PO43- eq.	2.00E-02	1.52E-03	3.31E-03	0.00E+00	2.07E-03	3.28E-04	5.21E-05	0.00E+00	5.82E-04
EP-freshwater	kg P eq.	4.22E-03	1.74E-04	7.78E-04	0.00E+00	4.31E-04	9.79E-05	5.75E-06	0.00E+00	8.36E-05
EP-marine	kg N eq.	1.61E-02	2.83E-03	1.73E-03	0.00E+00	1.23E-03	7.10E-05	8.36E-05	0.00E+00	8.00E-04
EP-terrestrial	mol N eq.	1.80E-01	3.09E-02	1.74E-02	0.00E+00	1.23E-02	5.84E-04	9.14E-04	0.00E+00	8.71E-03
POCP	kg NMVOC eq.	4.17E-02	7.66E-03	5.49E-03	0.00E+00	4.25E-03	1.67E-04	2.78E-04	0.00E+00	2.52E-03
ADP-minerals&metals*	kg Sb eq.	2.05E-04	7.90E-06	4.09E-05	0.00E+00	4.72E-05	2.88E-07	1.80E-06	0.00E+00	2.92E-06
ADP-fossil*	MJ	1.75E+02	3.42E+01	2.36E+01	0.00E+00	1.68E+01	1.79E+00	1.01E+00	0.00E+00	6.43E+00
WDP*	m^3	1.14E+01	1.15E-01	5.10E-01	0.00E+00	7.22E-01	2.02E-02	3.26E-03	0.00E+00	2.78E-01
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	1.04E+02	3.94E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	1.13E-02	0.00E+00	1.05E-01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.76E+02	3.94E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	1.13E-02	0.00E+00	1.05E-01
PENRE	MJ	1.88E+02	3.63E+01	2.51E+01	0.00E+00	1.80E+01	1.90E+00	1.07E+00	0.00E+00	6.83E+00
PENRM	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
PENRT	MJ	1.88E+02	3.63E+01	2.51E+01	0.00E+00	1.80E+01	1.90E+00	1.07E+00	0.00E+00	6.83E+00
SM	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
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
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
FW	m^3	1.11E-01	1.70E-03	6.76E-03	0.00E+00	8.89E-03	2.94E-04	4.82E-05	0.00E+00	3.90E-03

Environmental Information for Hardie® Trim 4/4 HZ5®/HZ10® (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	6.62E-04	8.89E-05	2.30E-05	0.00E+00	1.91E-05	2.04E-07	2.66E-06	0.00E+00	9.85E-06
NHWD	kg	3.60E+00	1.74E+00	2.22E+00	0.00E+00	4.00E-01	6.07E-03	4.77E-02	0.00E+00	2.60E+01
RWD	kg	4.69E-04	2.22E-04	9.01E-05	0.00E+00	4.63E-05	8.63E-06	6.63E-06	0.00E+00	3.84E-05
Output Flows	Unit	0.00E+00	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	1.81E+01	2.29E+00	1.67E+00	-3.11E+00	1.06E+00	1.12E-01	6.77E-02	0.00E+00	2.66E-01
Particulate matter	disease incidence	9.75E-07	1.59E-07	8.91E-08	0.00E+00	6.61E-08	1.87E-09	4.72E-09	0.00E+00	4.54E-08
Ionising radiation - human health**	kBq U-235 eq	9.15E-01	1.56E-01	2.29E-01	0.00E+00	9.28E-02	3.72E-02	4.69E-03	0.00E+00	3.02E-02
Eco-toxicity (freshwater)*	CTUe	3.61E+02	2.97E+01	4.69E+01	0.00E+00	2.91E+01	1.60E+00	8.88E-01	0.00E+00	5.17E+00
Human toxicity potential - cancer effects*	CTUh	1.31E-08	8.72E-10	8.34E-09	0.00E+00	1.53E-09	2.54E-11	2.29E-11	0.00E+00	1.73E-10
Human toxicity potential - non cancer effects*	CTUh	2.97E-07	2.84E-08	3.98E-08	0.00E+00	3.09E-08	7.68E-10	8.90E-10	0.00E+00	3.54E-09
Soil quality*	dimensionless	4.62E+02	2.41E+01	7.88E+00	0.00E+00	5.49E+00	2.93E-01	6.81E-01	0.00E+00	1.54E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

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Environmental Information for Hardie® Trim 4/4 NT3®

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	1.90E+01	5.49E+00	1.72E+00	-2.78E+00	1.11E+00	1.14E-01	8.01E-02	0.00E+00	2.73E-01
GWP-biogenic	kg CO_2 eq.	-4.59E+00	1.14E-02	1.87E-01	0.00E+00	3.92E-03	6.35E-04	3.08E-05	0.00E+00	3.00E-03
GWP-luluc	kg CO_2 eq.	8.81E-03	2.24E-03	1.10E-03	0.00E+00	8.73E-04	5.90E-05	2.88E-05	0.00E+00	1.23E-04
GWP-total	kg CO_2 eq.	1.44E+01	5.50E+00	1.91E+00	-2.78E+00	1.11E+00	1.15E-01	8.01E-02	0.00E+00	2.76E-01
ODP	kg CFC 11 eq.	1.44E-06	1.21E-06	1.56E-07	0.00E+00	1.02E-07	7.41E-09	1.74E-08	0.00E+00	8.48E-08
AP	mol H+ eq.	7.37E-02	2.27E-02	1.06E-02	0.00E+00	9.37E-03	3.83E-04	3.33E-04	0.00E+00	2.34E-03
EP-freshwater	kg PO43- eq.	1.78E-02	3.61E-03	3.31E-03	0.00E+00	2.07E-03	3.28E-04	6.10E-05	0.00E+00	5.82E-04
EP-freshwater	kg P eq.	3.71E-03	4.13E-04	7.79E-04	0.00E+00	4.31E-04	9.79E-05	6.72E-06	0.00E+00	8.36E-05
EP-marine	kg N eq.	1.58E-02	6.70E-03	1.74E-03	0.00E+00	1.23E-03	7.10E-05	9.78E-05	0.00E+00	8.00E-04
EP-terrestrial	mol N eq.	1.64E-01	7.31E-02	1.75E-02	0.00E+00	1.23E-02	5.84E-04	1.07E-03	0.00E+00	8.71E-03
POCP	kg NMVOC eq.	3.97E-02	1.81E-02	5.51E-03	0.00E+00	4.25E-03	1.67E-04	3.26E-04	0.00E+00	2.52E-03
ADP-minerals&metals*	kg Sb eq.	1.32E-04	1.87E-05	4.10E-05	0.00E+00	4.72E-05	2.88E-07	2.10E-06	0.00E+00	2.92E-06
ADP-fossil*	MJ	1.97E+02	8.09E+01	2.36E+01	0.00E+00	1.68E+01	1.79E+00	1.18E+00	0.00E+00	6.43E+00
WDP*	m^3	1.07E+01	2.71E-01	5.12E-01	0.00E+00	7.22E-01	2.02E-02	3.82E-03	0.00E+00	2.78E-01
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	1.01E+02	9.32E-01	2.45E+00	0.00E+00	1.09E+00	1.54E-01	1.32E-02	0.00E+00	1.05E-01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.70E+02	9.32E-01	2.45E+00	0.00E+00	1.09E+00	1.54E-01	1.32E-02	0.00E+00	1.05E-01
PENRE	MJ	2.12E+02	8.59E+01	2.52E+01	0.00E+00	1.80E+01	1.90E+00	1.25E+00	0.00E+00	6.83E+00
PENRM	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
PENRT	MJ	2.12E+02	8.59E+01	2.52E+01	0.00E+00	1.80E+01	1.90E+00	1.25E+00	0.00E+00	6.83E+00
SM	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
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
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
FW	m^3	1.04E-01	4.04E-03	6.79E-03	0.00E+00	8.89E-03	2.94E-04	5.63E-05	0.00E+00	3.90E-03

Environmental Information for Hardie® Trim 4/4 NT3® (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	5.78E-04	2.11E-04	2.31E-05	0.00E+00	1.91E-05	2.04E-07	3.11E-06	0.00E+00	9.85E-06
NHWD	kg	6.80E+00	4.11E+00	2.48E+00	0.00E+00	4.00E-01	6.07E-03	5.58E-02	0.00E+00	2.60E+01
RWD	kg	6.49E-04	5.25E-04	9.05E-05	0.00E+00	4.63E-05	8.63E-06	7.75E-06	0.00E+00	3.84E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	1.83E+01	5.43E+00	1.67E+00	-2.78E+00	1.06E+00	1.12E-01	7.91E-02	0.00E+00	2.66E-01
Particulate matter	disease incidence	8.94E-07	3.78E-07	8.95E-08	0.00E+00	6.61E-08	1.87E-09	5.52E-09	0.00E+00	4.54E-08
Ionising radiation - human health**	kBq U-235 eq	1.78E+00	3.69E-01	2.29E-01	0.00E+00	9.28E-02	3.72E-02	5.49E-03	0.00E+00	3.02E-02
Eco-toxicity (freshwater)*	CTUe	3.26E+02	7.03E+01	4.69E+01	0.00E+00	2.91E+01	1.60E+00	1.04E+00	0.00E+00	5.17E+00
Human toxicity potential - cancer effects*	CTUh	1.18E-08	2.07E-09	8.34E-09	0.00E+00	1.53E-09	2.54E-11	2.68E-11	0.00E+00	1.73E-10
Human toxicity potential - non cancer effects*	CTUh	2.51E-07	6.74E-08	3.99E-08	0.00E+00	3.09E-08	7.68E-10	1.04E-09	0.00E+00	3.54E-09
Soil quality*	dimensionless	4.54E+02	5.70E+01	8.03E+00	0.00E+00	5.49E+00	2.93E-01	7.97E-01	0.00E+00	1.54E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

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Environmental Information for Hardie Artisan® HZ10®

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	1.30E+01	2.13E+00	1.71E+00	-2.23E+00	1.11E+00	1.14E-01	6.92E-02	0.00E+00	2.73E-01
GWP-biogenic	kg CO_2 eq.	-3.46E+00	4.44E-03	1.87E-01	0.00E+00	3.92E-03	6.35E-04	2.66E-05	0.00E+00	3.00E-03
GWP-luluc	kg CO_2 eq.	5.05E-03	8.69E-04	1.09E-03	0.00E+00	8.73E-04	5.90E-05	2.49E-05	0.00E+00	1.23E-04
GWP-total	kg CO_2 eq.	9.53E+00	2.14E+00	1.90E+00	-2.23E+00	1.11E+00	1.15E-01	6.93E-02	0.00E+00	2.76E-01
ODP	kg CFC 11 eq.	9.68E-07	4.70E-07	1.52E-07	0.00E+00	1.02E-07	7.41E-09	1.50E-08	0.00E+00	8.48E-08
AP	mol H+ eq.	4.41E-02	8.82E-03	1.05E-02	0.00E+00	9.37E-03	3.83E-04	2.88E-04	0.00E+00	2.34E-03
EP-freshwater	kg PO43- eq.	1.27E-02	1.40E-03	3.28E-03	0.00E+00	2.07E-03	3.28E-04	5.27E-05	0.00E+00	5.82E-04
EP-freshwater	kg P eq.	2.88E-03	1.60E-04	7.75E-04	0.00E+00	4.31E-04	9.79E-05	5.81E-06	0.00E+00	8.36E-05
EP-marine	kg N eq.	1.06E-02	2.60E-03	1.70E-03	0.00E+00	1.23E-03	7.10E-05	8.46E-05	0.00E+00	8.00E-04
EP-terrestrial	mol N eq.	1.11E-01	2.84E-02	1.70E-02	0.00E+00	1.23E-02	5.84E-04	9.24E-04	0.00E+00	8.71E-03
POCP	kg NMVOC eq.	2.79E-02	7.04E-03	5.39E-03	0.00E+00	4.25E-03	1.67E-04	2.82E-04	0.00E+00	2.52E-03
ADP-minerals&metals*	kg Sb eq.	4.87E-05	7.26E-06	4.08E-05	0.00E+00	4.72E-05	2.88E-07	1.82E-06	0.00E+00	2.92E-06
ADP-fossil*	MJ	1.41E+02	3.14E+01	2.33E+01	0.00E+00	1.68E+01	1.79E+00	1.02E+00	0.00E+00	6.43E+00
WDP*	m^3	1.45E+01	1.05E-01	4.99E-01	0.00E+00	7.22E-01	2.02E-02	3.30E-03	0.00E+00	2.78E-01
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	7.48E+01	3.62E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	1.14E-02	0.00E+00	1.05E-01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.25E+02	3.62E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	1.14E-02	0.00E+00	1.05E-01
PENRE	MJ	1.52E+02	3.33E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	1.08E+00	0.00E+00	6.83E+00
PENRM	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
PENRT	MJ	1.52E+02	3.33E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	1.08E+00	0.00E+00	6.83E+00
SM	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
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
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
FW	m^3	6.37E-02	1.57E-03	6.62E-03	0.00E+00	8.89E-03	2.94E-04	4.87E-05	0.00E+00	3.90E-03

Environmental Information for Hardie Artisan® HZ10® (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	3.63E-04	8.18E-05	2.27E-05	0.00E+00	1.91E-05	2.04E-07	3.35E-06	0.00E+00	9.85E-06
NHWD	kg	3.30E+00	1.60E+00	1.30E+00	0.00E+00	4.00E-01	6.07E-03	6.01E-02	0.00E+00	2.60E+01
RWD	kg	3.65E-04	2.04E-04	8.87E-05	0.00E+00	4.63E-05	8.63E-06	8.35E-06	0.00E+00	3.84E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	1.26E+01	2.11E+00	1.66E+00	-2.23E+00	1.06E+00	1.12E-01	6.84E-02	0.00E+00	2.66E-01
Particulate matter	disease incidence	6.26E-07	1.47E-07	8.75E-08	0.00E+00	6.61E-08	1.87E-09	4.77E-09	0.00E+00	4.54E-08
Ionising radiation - human health**	kBq U-235 eq	8.14E-01	1.43E-01	2.28E-01	0.00E+00	9.28E-02	3.72E-02	4.75E-03	0.00E+00	3.02E-02
Eco-toxicity (freshwater)*	CTUe	1.86E+02	2.73E+01	4.67E+01	0.00E+00	2.91E+01	1.60E+00	8.98E-01	0.00E+00	5.17E+00
Human toxicity potential - cancer effects*	CTUh	7.10E-09	8.02E-10	8.33E-09	0.00E+00	1.53E-09	2.54E-11	2.31E-11	0.00E+00	1.73E-10
Human toxicity potential - non cancer effects*	CTUh	1.45E-07	2.61E-08	3.97E-08	0.00E+00	3.09E-08	7.68E-10	9.00E-10	0.00E+00	3.54E-09
Soil quality*	dimensionless	3.34E+02	2.21E+01	7.34E+00	0.00E+00	5.49E+00	2.93E-01	6.89E-01	0.00E+00	1.54E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

* Disclaimer: 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.
**Disclaimer – 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

Environmental Information for Hardie Artisan® HZ5®

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	1.94E+01	3.84E+00	1.71E+00	-1.85E+00	1.11E+00	1.14E-01	8.62E-02	0.00E+00	2.73E-01
GWP-biogenic	kg CO_2 eq.	-4.90E+00	7.98E-03	1.87E-01	0.00E+00	3.92E-03	6.35E-04	3.32E-05	0.00E+00	3.00E-03
GWP-luluc	kg CO_2 eq.	7.06E-03	1.56E-03	1.09E-03	0.00E+00	8.73E-04	5.90E-05	3.10E-05	0.00E+00	1.23E-04
GWP-total	kg CO_2 eq.	1.45E+01	3.85E+00	1.90E+00	-1.85E+00	1.11E+00	1.15E-01	8.63E-02	0.00E+00	2.76E-01
ODP	kg CFC 11 eq.	1.32E-06	8.46E-07	1.52E-07	0.00E+00	1.02E-07	7.41E-09	1.87E-08	0.00E+00	8.48E-08
AP	mol H+ eq.	6.26E-02	1.59E-02	1.05E-02	0.00E+00	9.37E-03	3.83E-04	3.58E-04	0.00E+00	2.34E-03
EP-freshwater	kg PO43- eq.	1.65E-02	2.52E-03	3.29E-03	0.00E+00	2.07E-03	3.28E-04	6.57E-05	0.00E+00	5.82E-04
EP-freshwater	kg P eq.	3.55E-03	2.88E-04	7.75E-04	0.00E+00	4.31E-04	9.79E-05	7.24E-06	0.00E+00	8.36E-05
EP-marine	kg N eq.	1.54E-02	4.68E-03	1.71E-03	0.00E+00	1.23E-03	7.10E-05	1.05E-04	0.00E+00	8.00E-04
EP-terrestrial	mol N eq.	1.59E-01	5.11E-02	1.71E-02	0.00E+00	1.23E-02	5.84E-04	1.15E-03	0.00E+00	8.71E-03
POCP	kg NMVOC eq.	3.97E-02	1.27E-02	5.40E-03	0.00E+00	4.25E-03	1.67E-04	3.51E-04	0.00E+00	2.52E-03
ADP-minerals&metals*	kg Sb eq.	7.28E-05	1.31E-05	4.08E-05	0.00E+00	4.72E-05	2.88E-07	2.27E-06	0.00E+00	2.92E-06
ADP-fossil*	MJ	1.97E+02	5.65E+01	2.33E+01	0.00E+00	1.68E+01	1.79E+00	1.27E+00	0.00E+00	6.43E+00
WDP*	m^3	1.62E+01	1.90E-01	5.00E-01	0.00E+00	7.22E-01	2.02E-02	4.11E-03	0.00E+00	2.78E-01
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	1.07E+02	6.51E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	1.42E-02	0.00E+00	1.05E-01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.82E+02	6.51E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	1.42E-02	0.00E+00	1.05E-01
PENRE	MJ	2.11E+02	6.00E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	1.35E+00	0.00E+00	6.83E+00
PENRM	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
PENRT	MJ	2.11E+02	6.00E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	1.35E+00	0.00E+00	6.83E+00
SM	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
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
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
FW	m^3	8.73E-02	2.82E-03	6.62E-03	0.00E+00	8.89E-03	2.94E-04	6.07E-05	0.00E+00	3.90E-03

Environmental Information for Hardie Artisan® HZ5® (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	5.19E-04	1.47E-04	2.27E-05	0.00E+00	1.91E-05	2.04E-07	3.35E-06	0.00E+00	9.85E-06
NHWD	kg	5.79E+00	2.87E+00	1.30E+00	0.00E+00	4.00E-01	6.07E-03	6.01E-02	0.00E+00	2.60E+01
RWD	kg	6.04E-04	3.67E-04	8.87E-05	0.00E+00	4.63E-05	8.63E-06	8.35E-06	0.00E+00	3.84E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	1.88E+01	3.79E+00	1.66E+00	-1.85E+00	1.06E+00	1.12E-01	8.53E-02	0.00E+00	2.66E-01
Particulate matter	disease incidence	8.54E-07	2.64E-07	8.75E-08	0.00E+00	6.61E-08	1.87E-09	5.95E-09	0.00E+00	4.54E-08
Ionising radiation - human health**	kBq U-235 eq	1.56E+00	2.58E-01	2.28E-01	0.00E+00	9.28E-02	3.72E-02	5.91E-03	0.00E+00	3.02E-02
Eco-toxicity (freshwater)*	CTUe	2.83E+02	4.91E+01	4.67E+01	0.00E+00	2.91E+01	1.60E+00	1.12E+00	0.00E+00	5.17E+00
Human toxicity potential - cancer effects*	CTUh	9.65E-09	1.44E-09	8.33E-09	0.00E+00	1.53E-09	2.54E-11	2.88E-11	0.00E+00	1.73E-10
Human toxicity potential - non cancer effects*	CTUh	2.03E-07	4.71E-08	3.97E-08	0.00E+00	3.09E-08	7.68E-10	1.12E-09	0.00E+00	3.54E-09
Soil quality*	dimensionless	4.78E+02	3.98E+01	7.34E+00	0.00E+00	5.49E+00	2.93E-01	8.59E-01	0.00E+00	1.54E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

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Environmental Information for Hardie® Backer Board 1/4” (EZ Grid®)

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	4.15E+00	7.14E-01	1.71E+00	-7.03E-01	1.11E+00	1.14E-01	2.17E-02	0.00E+00	2.73E-01
GWP-biogenic	kg CO_2 eq.	-1.09E+00	1.49E-03	1.87E-01	0.00E+00	3.92E-03	6.35E-04	8.35E-06	0.00E+00	3.00E-03
GWP-luluc	kg CO_2 eq.	1.58E-03	2.91E-04	1.09E-03	0.00E+00	8.73E-04	5.90E-05	7.80E-06	0.00E+00	1.23E-04
GWP-total	kg CO_2 eq.	3.07E+00	7.16E-01	1.90E+00	-7.03E-01	1.11E+00	1.15E-01	2.17E-02	0.00E+00	2.76E-01
ODP	kg CFC 11 eq.	3.07E-07	1.57E-07	1.52E-07	0.00E+00	1.02E-07	7.41E-09	4.71E-09	0.00E+00	8.48E-08
AP	mol H+ eq.	1.37E-02	2.95E-03	1.05E-02	0.00E+00	9.37E-03	3.83E-04	9.02E-05	0.00E+00	2.34E-03
EP-freshwater	kg PO43- eq.	4.10E-03	4.69E-04	3.29E-03	0.00E+00	2.07E-03	3.28E-04	1.65E-05	0.00E+00	5.82E-04
EP-freshwater	kg P eq.	9.48E-04	5.37E-05	7.75E-04	0.00E+00	4.31E-04	9.79E-05	1.82E-06	0.00E+00	8.36E-05
EP-marine	kg N eq.	3.32E-03	8.71E-04	1.71E-03	0.00E+00	1.23E-03	7.10E-05	2.65E-05	0.00E+00	8.00E-04
EP-terrestrial	mol N eq.	3.41E-02	9.51E-03	1.71E-02	0.00E+00	1.23E-02	5.84E-04	2.90E-04	0.00E+00	8.71E-03
POCP	kg NMVOC eq.	8.57E-03	2.36E-03	5.40E-03	0.00E+00	4.25E-03	1.67E-04	8.83E-05	0.00E+00	2.52E-03
ADP-minerals&metals*	kg Sb eq.	1.50E-05	2.43E-06	4.08E-05	0.00E+00	4.72E-05	2.88E-07	5.71E-07	0.00E+00	2.92E-06
ADP-fossil*	MJ	4.46E+01	1.05E+01	2.33E+01	0.00E+00	1.68E+01	1.79E+00	3.20E-01	0.00E+00	6.43E+00
WDP*	m^3	3.82E+00	3.53E-02	5.00E-01	0.00E+00	7.22E-01	2.02E-02	1.04E-03	0.00E+00	2.78E-01
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	2.39E+01	1.21E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	3.57E-03	0.00E+00	1.05E-01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	3.98E+01	1.21E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	3.57E-03	0.00E+00	1.05E-01
PENRE	MJ	4.81E+01	1.12E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	3.40E-01	0.00E+00	6.83E+00
PENRM	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
PENRT	MJ	4.81E+01	1.12E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	3.40E-01	0.00E+00	6.83E+00
SM	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
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
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
FW	m^3	2.12E-02	5.25E-04	6.62E-03	0.00E+00	8.89E-03	2.94E-04	1.53E-05	0.00E+00	3.90E-03

Environmental Information for Hardie® Backer Board 1/4” (EZ Grid®) (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	1.14E-04	2.74E-05	2.27E-05	0.00E+00	1.91E-05	2.04E-07	8.44E-07	0.00E+00	9.85E-06
NHWD	kg	1.09E+00	5.35E-01	1.35E+00	0.00E+00	4.00E-01	6.07E-03	1.51E-02	0.00E+00	2.60E+01
RWD	kg	1.20E-04	6.83E-05	8.88E-05	0.00E+00	4.63E-05	8.63E-06	2.10E-06	0.00E+00	3.84E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	4.03E+00	7.06E-01	1.66E+00	-7.03E-01	1.06E+00	1.12E-01	2.15E-02	0.00E+00	2.66E-01
Particulate matter	disease incidence	1.91E-07	4.91E-08	8.76E-08	0.00E+00	6.61E-08	1.87E-09	1.50E-09	0.00E+00	4.54E-08
Ionising radiation - human health**	kBq U-235 eq	2.84E-01	4.80E-02	2.28E-01	0.00E+00	9.28E-02	3.72E-02	1.49E-03	0.00E+00	3.02E-02
Eco-toxicity (freshwater)*	CTUe	5.96E+01	9.15E+00	4.67E+01	0.00E+00	2.91E+01	1.60E+00	2.82E-01	0.00E+00	5.17E+00
Human toxicity potential - cancer effects*	CTUh	2.22E-09	2.69E-10	8.33E-09	0.00E+00	1.53E-09	2.54E-11	7.26E-12	0.00E+00	1.73E-10
Human toxicity potential - non cancer effects*	CTUh	4.56E-08	8.76E-09	3.97E-08	0.00E+00	3.09E-08	7.68E-10	2.82E-10	0.00E+00	3.54E-09
Soil quality*	dimensionless	1.05E+02	7.41E+00	7.36E+00	0.00E+00	5.49E+00	2.93E-01	2.16E-01	0.00E+00	1.54E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

* Disclaimer: 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.
**Disclaimer – 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

Environmental Information for Hardie® Soffit Panels HZ5®

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	6.11E+00	1.21E+00	1.71E+00	-1.17E+00	1.11E+00	1.14E-01	2.72E-02	0.00E+00	2.73E-01
GWP-biogenic	kg CO_2 eq.	-1.55E+00	2.52E-03	1.87E-01	0.00E+00	3.92E-03	6.35E-04	1.05E-05	0.00E+00	3.00E-03
GWP-luluc	kg CO_2 eq.	2.23E-03	4.94E-04	1.09E-03	0.00E+00	8.73E-04	5.90E-05	9.79E-06	0.00E+00	1.23E-04
GWP-total	kg CO_2 eq.	4.57E+00	1.22E+00	1.90E+00	-1.17E+00	1.11E+00	1.15E-01	2.73E-02	0.00E+00	2.76E-01
ODP	kg CFC 11 eq.	4.16E-07	2.67E-07	1.52E-07	0.00E+00	1.02E-07	7.41E-09	5.91E-09	0.00E+00	8.48E-08
AP	mol H+ eq.	1.98E-02	5.02E-03	1.05E-02	0.00E+00	9.37E-03	3.83E-04	1.13E-04	0.00E+00	2.34E-03
EP-freshwater	kg PO43- eq.	5.20E-03	7.96E-04	3.29E-03	0.00E+00	2.07E-03	3.28E-04	2.08E-05	0.00E+00	5.82E-04
EP-freshwater	kg P eq.	1.12E-03	9.11E-05	7.75E-04	0.00E+00	4.31E-04	9.79E-05	2.29E-06	0.00E+00	8.36E-05
EP-marine	kg N eq.	4.86E-03	1.48E-03	1.71E-03	0.00E+00	1.23E-03	7.10E-05	3.33E-05	0.00E+00	8.00E-04
EP-terrestrial	mol N eq.	5.02E-02	1.61E-02	1.71E-02	0.00E+00	1.23E-02	5.84E-04	3.64E-04	0.00E+00	8.71E-03
POCP	kg NMVOC eq.	1.25E-02	4.00E-03	5.40E-03	0.00E+00	4.25E-03	1.67E-04	1.11E-04	0.00E+00	2.52E-03
ADP-minerals&metals*	kg Sb eq.	2.30E-05	4.13E-06	4.08E-05	0.00E+00	4.72E-05	2.88E-07	7.16E-07	0.00E+00	2.92E-06
ADP-fossil*	MJ	6.21E+01	1.79E+01	2.33E+01	0.00E+00	1.68E+01	1.79E+00	4.02E-01	0.00E+00	6.43E+00
WDP*	m^3	5.12E+00	5.99E-02	5.00E-01	0.00E+00	7.22E-01	2.02E-02	1.30E-03	0.00E+00	2.78E-01
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	3.40E+01	2.06E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	4.48E-03	0.00E+00	1.05E-01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	5.75E+01	2.06E-01	2.44E+00	0.00E+00	1.09E+00	1.54E-01	4.48E-03	0.00E+00	1.05E-01
PENRE	MJ	6.67E+01	1.90E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	4.26E-01	0.00E+00	6.83E+00
PENRM	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
PENRT	MJ	6.67E+01	1.90E+01	2.49E+01	0.00E+00	1.80E+01	1.90E+00	4.26E-01	0.00E+00	6.83E+00
SM	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
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
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
FW	m^3	2.76E-02	8.91E-04	6.62E-03	0.00E+00	8.89E-03	2.94E-04	1.92E-05	0.00E+00	3.90E-03

Environmental Information for Hardie® Soffit Panels HZ5® (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	1.64E-04	4.65E-05	2.27E-05	0.00E+00	1.91E-05	2.04E-07	1.06E-06	0.00E+00	9.85E-06
NHWD	kg	1.83E+00	9.08E-01	1.30E+00	0.00E+00	4.00E-01	6.07E-03	1.90E-02	0.00E+00	2.60E+01
RWD	kg	1.91E-04	1.16E-04	8.87E-05	0.00E+00	4.63E-05	8.63E-06	2.64E-06	0.00E+00	3.84E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO2 eq.	5.93E+00	1.20E+00	1.66E+00	-1.17E+00	1.06E+00	1.12E-01	2.69E-02	0.00E+00	2.66E-01
Particulate matter	disease incidence	2.70E-07	8.34E-08	8.75E-08	0.00E+00	6.61E-08	1.87E-09	1.88E-09	0.00E+00	4.54E-08
Ionising radiation - human health**	kBq U-235 eq	4.92E-01	8.15E-02	2.28E-01	0.00E+00	9.28E-02	3.72E-02	1.87E-03	0.00E+00	3.02E-02
Eco-toxicity (freshwater)*	CTUe	8.94E+01	1.55E+01	4.67E+01	0.00E+00	2.91E+01	1.60E+00	3.54E-01	0.00E+00	5.17E+00
Human toxicity potential - cancer effects*	CTUh	3.05E-09	4.56E-10	8.33E-09	0.00E+00	1.53E-09	2.54E-11	9.11E-12	0.00E+00	1.73E-10
Human toxicity potential - non cancer effects*	CTUh	6.42E-08	1.49E-08	3.97E-08	0.00E+00	3.09E-08	7.68E-10	3.54E-10	0.00E+00	3.54E-09
Soil quality*	dimensionless	1.51E+02	1.26E+01	7.34E+00	0.00E+00	5.49E+00	2.93E-01	2.71E-01	0.00E+00	1.54E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

* Disclaimer: 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.
**Disclaimer – 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

Environmental Information for Hardie® Architectural Panel HZ5®

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	6.28E+00	1.82E+00	1.72E+00	-9.21E-01	1.11E+00	1.14E-01	2.65E-02	0.00E+00	2.73E-01
GWP-biogenic	kg CO_2 eq.	-1.52E+00	3.79E-03	1.87E-01	0.00E+00	3.92E-03	6.35E-04	1.02E-05	0.00E+00	3.00E-03
GWP-luluc	kg CO_2 eq.	2.92E-03	7.42E-04	1.10E-03	0.00E+00	8.73E-04	5.90E-05	9.54E-06	0.00E+00	1.23E-04
GWP-total	kg CO_2 eq.	4.76E+00	1.82E+00	1.91E+00	-9.21E-01	1.11E+00	1.15E-01	2.66E-02	0.00E+00	2.76E-01
ODP	kg CFC 11 eq.	4.75E-07	4.01E-07	1.56E-07	0.00E+00	1.02E-07	7.41E-09	5.76E-09	0.00E+00	8.48E-08
AP	mol H+ eq.	2.44E-02	7.53E-03	1.06E-02	0.00E+00	9.37E-03	3.83E-04	1.10E-04	0.00E+00	2.34E-03
EP-freshwater	kg PO43- eq.	5.87E-03	1.20E-03	3.31E-03	0.00E+00	2.07E-03	3.28E-04	2.02E-05	0.00E+00	5.82E-04
EP-freshwater	kg P eq.	1.23E-03	1.37E-04	7.79E-04	0.00E+00	4.31E-04	9.79E-05	2.23E-06	0.00E+00	8.36E-05
EP-marine	kg N eq.	5.23E-03	2.22E-03	1.74E-03	0.00E+00	1.23E-03	7.10E-05	3.24E-05	0.00E+00	8.00E-04
EP-terrestrial	mol N eq.	5.44E-02	2.43E-02	1.75E-02	0.00E+00	1.23E-02	5.84E-04	3.54E-04	0.00E+00	8.71E-03
POCP	kg NMVOC eq.	1.31E-02	6.01E-03	5.51E-03	0.00E+00	4.25E-03	1.67E-04	1.08E-04	0.00E+00	2.52E-03
ADP-minerals&metals*	kg Sb eq.	4.38E-05	6.20E-06	4.10E-05	0.00E+00	4.72E-05	2.88E-07	6.98E-07	0.00E+00	2.92E-06
ADP-fossil*	MJ	6.52E+01	2.68E+01	2.36E+01	0.00E+00	1.68E+01	1.79E+00	3.91E-01	0.00E+00	6.43E+00
WDP*	m^3	3.55E+00	9.00E-02	5.12E-01	0.00E+00	7.22E-01	2.02E-02	1.27E-03	0.00E+00	2.78E-01
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	3.33E+01	3.09E-01	2.45E+00	0.00E+00	1.09E+00	1.54E-01	4.37E-03	0.00E+00	1.05E-01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	5.65E+01	3.09E-01	2.45E+00	0.00E+00	1.09E+00	1.54E-01	4.37E-03	0.00E+00	1.05E-01
PENRE	MJ	6.99E+01	2.85E+01	2.52E+01	0.00E+00	1.80E+01	1.90E+00	4.15E-01	0.00E+00	6.83E+00
PENRM	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
PENRT	MJ	6.99E+01	2.85E+01	2.52E+01	0.00E+00	1.80E+01	1.90E+00	4.15E-01	0.00E+00	6.83E+00
SM	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
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
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
FW	m^3	3.44E-02	1.34E-03	6.79E-03	0.00E+00	8.89E-03	2.94E-04	1.87E-05	0.00E+00	3.90E-03

Environmental Information for Hardie® Architectural Panel HZ5® (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	1.91E-04	6.99E-05	2.31E-05	0.00E+00	1.91E-05	2.04E-07	1.03E-06	0.00E+00	9.85E-06
NHWD	kg	2.24E+00	1.36E+00	2.48E+00	0.00E+00	4.00E-01	6.07E-03	1.85E-02	0.00E+00	2.60E+01
RWD	kg	2.14E-04	1.74E-04	9.05E-05	0.00E+00	4.63E-05	8.63E-06	2.57E-06	0.00E+00	3.84E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	6.06E+00	1.80E+00	1.67E+00	-9.21E-01	1.06E+00	1.12E-01	2.62E-02	0.00E+00	2.66E-01
Particulate matter	disease incidence	2.96E-07	1.25E-07	8.95E-08	0.00E+00	6.61E-08	1.87E-09	1.83E-09	0.00E+00	4.54E-08
Ionising radiation - human health**	kBq U-235 eq	5.87E-01	1.22E-01	2.29E-01	0.00E+00	9.28E-02	3.72E-02	1.82E-03	0.00E+00	3.02E-02
Eco-toxicity (freshwater)*	CTUe	1.08E+02	2.33E+01	4.69E+01	0.00E+00	2.91E+01	1.60E+00	3.45E-01	0.00E+00	5.17E+00
Human toxicity potential - cancer effects*	CTUh	3.91E-09	6.85E-10	8.34E-09	0.00E+00	1.53E-09	2.54E-11	8.87E-12	0.00E+00	1.73E-10
Human toxicity potential - non cancer effects*	CTUh	8.30E-08	2.23E-08	3.99E-08	0.00E+00	3.09E-08	7.68E-10	3.45E-10	0.00E+00	3.54E-09
Soil quality*	dimensionless	1.50E+02	1.89E+01	8.03E+00	0.00E+00	5.49E+00	2.93E-01	2.64E-01	0.00E+00	1.54E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

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**Disclaimer – 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

Environmental Information for Hardie® Artisan® Trim

Environmental Impacts	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-fossil	kg CO_2 eq.	3.80E+01	1.10E+01	1.72E+00	-5.56E+00	1.11E+00	1.14E-01	1.60E-01	0.00E+00	2.73E-01
GWP-biogenic	kg CO_2 eq.	-9.18E+00	2.29E-02	1.87E-01	0.00E+00	3.92E-03	6.35E-04	6.16E-05	0.00E+00	3.00E-03
GWP-luluc	kg CO_2 eq.	1.76E-02	4.48E-03	1.10E-03	0.00E+00	8.73E-04	5.90E-05	5.75E-05	0.00E+00	1.23E-04
GWP-total	kg CO_2 eq.	2.88E+01	1.10E+01	1.91E+00	-5.56E+00	1.11E+00	1.15E-01	1.60E-01	0.00E+00	2.76E-01
ODP	kg CFC 11 eq.	2.87E-06	2.42E-06	1.56E-07	0.00E+00	1.02E-07	7.41E-09	3.48E-08	0.00E+00	8.48E-08
AP	mol H+ eq.	1.47E-01	4.54E-02	1.06E-02	0.00E+00	9.37E-03	3.83E-04	6.65E-04	0.00E+00	2.34E-03
EP-freshwater	kg PO43- eq.	3.55E-02	7.21E-03	3.31E-03	0.00E+00	2.07E-03	3.28E-04	1.22E-04	0.00E+00	5.82E-04
EP-freshwater	kg P eq.	7.42E-03	8.25E-04	7.79E-04	0.00E+00	4.31E-04	9.79E-05	1.34E-05	0.00E+00	8.36E-05
EP-marine	kg N eq.	3.16E-02	1.34E-02	1.74E-03	0.00E+00	1.23E-03	7.10E-05	1.96E-04	0.00E+00	8.00E-04
EP-terrestrial	mol N eq.	3.29E-01	1.46E-01	1.75E-02	0.00E+00	1.23E-02	5.84E-04	2.14E-03	0.00E+00	8.71E-03
POCP	kg NMVOC eq.	7.94E-02	3.63E-02	5.51E-03	0.00E+00	4.25E-03	1.67E-04	6.51E-04	0.00E+00	2.52E-03
ADP-minerals&metals*	kg Sb eq.	2.64E-04	3.74E-05	4.10E-05	0.00E+00	4.72E-05	2.88E-07	4.21E-06	0.00E+00	2.92E-06
ADP-fossil*	MJ	3.95E+02	1.62E+02	2.36E+01	0.00E+00	1.68E+01	1.79E+00	2.36E+00	0.00E+00	6.43E+00
WDP*	m^3	2.14E+01	5.43E-01	5.12E-01	0.00E+00	7.22E-01	2.02E-02	7.64E-03	0.00E+00	2.78E-01
Resource Use	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
PERE	MJ	2.01E+02	1.86E+00	2.45E+00	0.00E+00	1.09E+00	1.54E-01	2.63E-02	0.00E+00	1.05E-01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	3.41E+02	1.86E+00	2.45E+00	0.00E+00	1.09E+00	1.54E-01	2.63E-02	0.00E+00	1.05E-01
PENRE	MJ	4.23E+02	1.72E+02	2.52E+01	0.00E+00	1.80E+01	1.90E+00	2.51E+00	0.00E+00	6.83E+00
PENRM	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
PENRT	MJ	4.23E+02	1.72E+02	2.52E+01	0.00E+00	1.80E+01	1.90E+00	2.51E+00	0.00E+00	6.83E+00
SM	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
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
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
FW	m^3	2.08E-01	8.07E-03	6.79E-03	0.00E+00	8.89E-03	2.94E-04	1.13E-04	0.00E+00	3.90E-03

Environmental Information for Hardie® Artisan® Trim (cont)

Waste Production	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
HWD	kg	1.16E-03	4.21E-04	2.31E-05	0.00E+00	1.91E-05	2.04E-07	6.22E-06	0.00E+00	9.85E-06
NHWD	kg	1.36E+01	8.23E+00	2.48E+00	0.00E+00	4.00E-01	6.07E-03	1.12E-01	0.00E+00	2.60E+01
RWD	kg	1.30E-03	1.05E-03	9.05E-05	0.00E+00	4.63E-05	8.63E-06	1.55E-05	0.00E+00	3.84E-05
Output Flows	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
Components for re-use	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
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	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
Additional Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4
GWP-GHG	kg CO_2 eq.	3.66E+01	1.09E+01	1.67E+00	-5.56E+00	1.06E+00	1.12E-01	1.58E-01	0.00E+00	2.66E-01
Particulate matter	disease incidence	1.79E-06	7.55E-07	8.95E-08	0.00E+00	6.61E-08	1.87E-09	1.10E-08	0.00E+00	4.54E-08
Ionising radiation - human health**	kBq U-235 eq	3.56E+00	7.38E-01	2.29E-01	0.00E+00	9.28E-02	3.72E-02	1.10E-02	0.00E+00	3.02E-02
Eco-toxicity (freshwater)*	CTUe	6.51E+02	1.41E+02	4.69E+01	0.00E+00	2.91E+01	1.60E+00	2.08E+00	0.00E+00	5.17E+00
Human toxicity potential - cancer effects*	CTUh	2.36E-08	4.13E-09	8.34E-09	0.00E+00	1.53E-09	2.54E-11	5.35E-11	0.00E+00	1.73E-10
Human toxicity potential - non cancer effects*	CTUh	5.01E-07	1.35E-07	3.99E-08	0.00E+00	3.09E-08	7.68E-10	2.08E-09	0.00E+00	3.54E-09
Soil quality*	dimensionless	9.08E+02	1.14E+02	8.03E+00	0.00E+00	5.49E+00	2.93E-01	1.59E+00	0.00E+00	1.54E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

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Environmental Product Declaration

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

Products from James Hardie North America

Program: EPD International — www.environdec.com
Program Operator: EPD International
EPD Registration Number: S-P-05037

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Geographic Scope: North America

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