

## ENVIRONMENTAL PRODUCT DECLARATION

# RUBBER FLOOR TILE

ROPPE DIMENSIONS, FIESTA®, DESIGNER'S CHOICE®, HEALTH & LEARNING,  
SMOOTH AND MARBLEIZED RUBBER TILE



*There are a large number of applications for rubber floor tiles. Versatile profile options that lend themselves to classic and contemporary designs make rubber flooring a great choice. Commercial applications include healthcare, education, corporate, retail and hospitality.*

*Pictured above: Roppe Dimensions rubber tile, manufactured in Fostoria, Ohio*

**ROPPE.**  
Proven. Flooring. Experiences.

The success of Roppe Corporation over 60 years is based on people: employees, customers, and the local and regional communities in which we manufacture products. We are committed to their sustainable livelihoods and futures. The company is family owned and an integral part of the small Midwestern town of Fostoria, Ohio.

Sustainability requires work and complex decision-making. Over the decades, we have continuously worked with raw material suppliers and with the test laboratory and production lines to improve the formulations for Roppe's products – always preserving durability and improving aesthetics while reducing hazardous components. Materials science is an important issue for the architectural community, and the precautionary principle is becoming an industry standard through our customers' efforts. This EPD reflects that new understanding, with energy and water reductions highlighted.

For additional information, visit [www.roppe.com](http://www.roppe.com).



# ENVIRONMENTAL PRODUCT DECLARATION




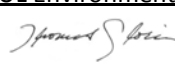
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According to ISO 14025

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds, e.g., Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. Accuracy of Results: EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.



|   |  |  |
|---|--|--|
| PROGRAM OPERATOR  | UL Environment   |  |
| DECLARATION HOLDER  | Roppe  |  |
| DECLARATION NUMBER  | 4786388448.101.1   |  |
| DECLARED PRODUCT  | Rubber Floor Tile  |  |
| REFERENCE PCR   | NSF PCR for Flooring v2.0  |  |
| DATE OF ISSUE   | December 19, 2016  |  |
| PERIOD OF VALIDITY  | 5 Years  |  |
| CONTENTS OF THE DECLARATION   | Product definition and information about building physics<br>Information about basic material and the material's origin<br>Description of the product's manufacture<br>Indication of product processing<br>Information about the in-use conditions<br>Life cycle assessment results<br>Testing results and verifications |  |
| The PCR review was conducted by:  | PCR Review Panel   |  |
|   | ncss@nsf.org   |  |
| This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories<br><input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL |   |  |
|   | Wade Stout, UL Environment   |  |
| This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:  |   |  |
|   | Thomas Gloria, Industrial Ecology Consultants  |  |

Environment





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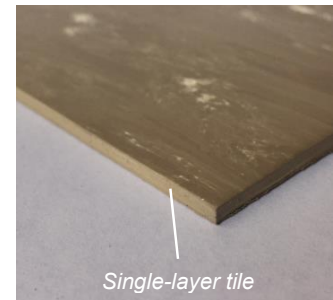
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Product Definition

Product Classification and Description

The declaration for Roppe rubber floor tile covers a broad range of styles produced by Roppe’s manufacturing plant in Fostoria, OH. Rubber tile is made from a homogeneous composition of synthetic rubber, fillers, and additives. It is commonly available in thicknesses of 2.0 mm (80 mil), 3.2 mm (1/8”), 6.4 mm (1/4”), 9.6 mm (3/8”). Profile heights range from 0.4 to 1.2 mm. The manufacturing process results in a single layer. This tile is most often used in commercial buildings. Roppe products are known for their durability and ease of maintenance throughout the product life, while also providing underfoot comfort, reduced noise from foot traffic, and inherent slip resistance. The defined Reference Service Life (RSL) is 40 years.



Product Characteristics

| Rubber Floor Tile             | Average Value   | Unit             | Minimum Value | Maximum Value |               |
|-------------------------------|---|------------------|---------------|---------------|---------------|
| Product thickness             | 2.0   | mm               | 2.0           | 9.6           |               |
| Wear layer thickness          | N/A   | mm               | N/A           | N/A           |               |
| Product weight                | 5,290   | g/m <sup>2</sup> | 5,100         | 18,520        |               |
| Product form:                 | Tiles   | 500 x 500        | mm            | 500 x 500     | 1,000 x 1,000 |
| VOC emissions test method     | Compliant with California Department of Public Health Standard v1.1, 2010 and certified by FloorScore® Flooring Products Certification Program for Indoor Air Quality |                  |               |               |               |
| Sustainability certifications | Certified to NSF / ANSI – 332 (2015) Sustainability Assessment for Resilient Floor Coverings – Gold Level   |                  |               |               |               |

Product Standards and Accreditation

The products considered in the EPD meet or exceed the following technical specifications:

- ASTM F 1344 – Standard Specification for Rubber Floor Tile
- Fire Testing Class 1 when tested in accordance with ASTM E 648/NFPA 253, Standard Test Method for Critical Radiant Flux if applicable
- Fire Testing FSCI-150; SD-150 when tested in accordance with CAN/ULC S102.2, Standard test Method for Flame Spread Rating and Smoke Development if applicable
- Anti-fungal Testing ASTM G 21 – Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

Compliant with FloorScore® Flooring Products Certification Program for Indoor Air Quality. This test program includes volatile organic compounds, including formaldehyde, acetaldehyde, styrene, and other compounds of concern.

Certified to NSF / ANSI – 332 (2015) Sustainability Assessment for Resilient Floor Coverings at Gold Level.





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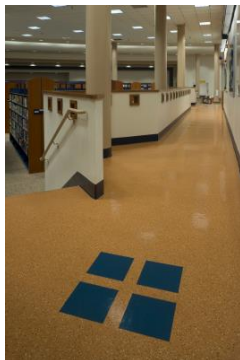
Product Lines



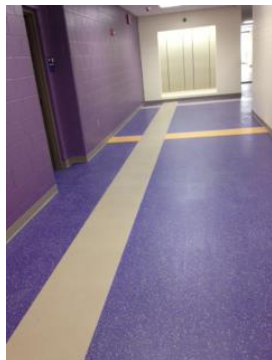
**Dimensions Rubber Tile**

Dimensions Rubber Tile was developed using random patterns and geometric shapes in our most popular patterns. Dimensions coordinates with other Roppe products and can be mixed and matched with tile, treads, wall base and accessories. This product is a resilient, homogeneous, rubber tile which provides excellent resistance to abrasion, chipping, cracking and permanent indentations and yet provides fast and economical installation.

Dimensions Crackle Rubber Tile



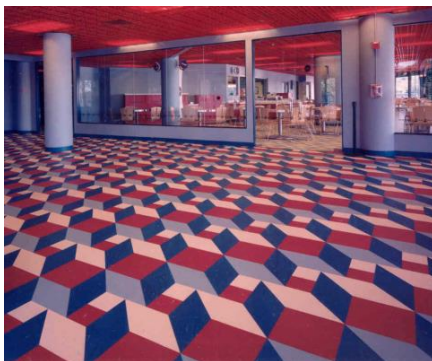
Fiesta Rubber Tile



Fiesta Rubber Tile (custom colors)

**Fiesta® Rubber Tile**

A favorite of designers, Fiesta is not only long lasting, it's also great looking and an excellent choice for custom projects. Fiesta colors coordinate with other Roppe products and can be mixed and matched with tile, treads, wall base and accessories. This product is a resilient, homogeneous, rubber tile which provides excellent resistance to abrasion, chipping, cracking and permanent indentations and yet provides fast and economical installation.



Designer's Choice Rubber Tile

**Designer's Choice®**

The design possibilities are almost limitless with Designer's Choice. Its eleven geometric shapes available in 1/8" (3.175 mm) Smooth, Hammered or Textured Designs make it an attractive option for personalized flooring applications. Use one of our designs to make your flooring come alive, or create a unique look all your own with durable and attractive Designer's Choice. The colors coordinate with other Roppe products and can be mixed and matched with tile, treads, wall base and accessories. This product is a resilient, homogeneous, rubber tile which provides excellent resistance to abrasion, chipping, cracking and permanent indentations and yet provides fast and economical installation.

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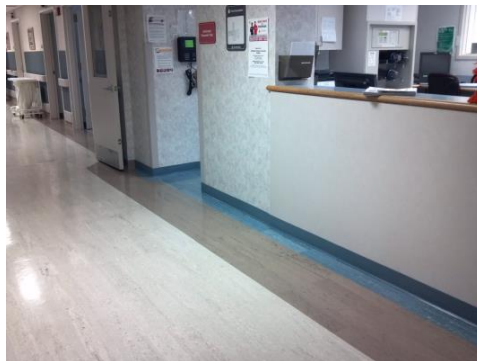
**Health & Learning Rubber Tile**

Health & Learning Rubber Tile was developed using our most popular tile designs and patterns. Health & Learning colors coordinate with other Roppe products and can be mixed and matched with tile, treads, wall base and accessories. This product is a resilient, homogeneous, rubber tile which provides excellent resistance to abrasion, chipping, cracking and permanent indentations and yet provides fast and economical installation.

Health & Learning  
Rubber Tile



Smooth Rubber Tile



Smooth | Marbleized Rubber Tile

**Smooth/Marbleized Rubber Tile**

Smooth design is available in solid or marble colors that make rubber flooring a great choice. Smooth design coordinate with other Roppe products and can be mixed and matched with tile, treads, wall base and accessories. This product is a resilient, homogeneous, rubber tile which provides excellent resistance to abrasion, chipping, cracking and permanent indentations and yet provides fast and economical installation.



Fiesta Rubber Tile  
with custom logo



Smooth Rubber Tile  
with custom logo

**Custom Designs**

Custom colors and logos are available for Fiesta Rubber Tile and Smooth Rubber Tile.





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Material Content of Product

| Component         | Material               | Mass %* | Availability   |                  |              | Origin of raw materials |
|-------------------|------------------------|---------|----------------|------------------|--------------|-------------------------|
|                   |                        |         | Renewable      | Non-renewable    | Recycled     |                         |
| Filler            | Kaolin                 | 55-65   |                | Mineral abundant |              | US                      |
| Binder            | SBR                    | 20-35   |                | Fossil limited   |              | US                      |
| Additive          | Epoxidized soybean oil | 1.5-2.5 | Bio-based crop |                  |              | US                      |
| Additives         | Various                | 6-8     |                | Various          |              | US                      |
| Recycled material | Scrap                  | 2-3     |                |                  | Pre-consumer | US                      |
| Other components  | Various                | 1-2     |                | Various          |              | US                      |

Production of Main Materials

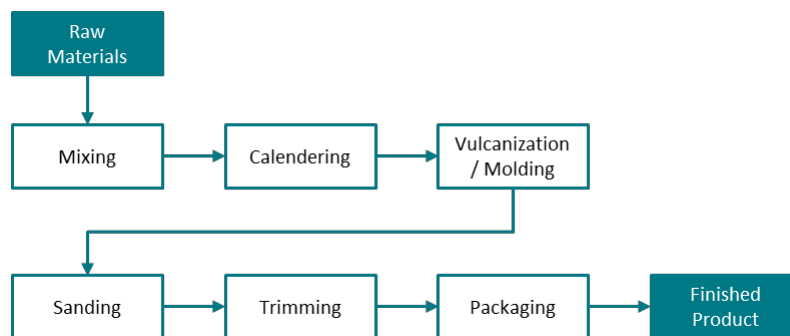
**Kaolin:** A clay mineral used as inert filler.

**Styrene Butadiene Rubber (SBR):** A synthetic copolymer that is used as a primary cross-linkable binder in the manufacture of rubber flooring products.

This product is free of phthalates, flame retardants, perfumes, and metals of concern (e.g., hexavalent chromium, lead, mercury, etc.)

Production of Rubber Flooring

Floor tile is produced in several stages beginning with a thorough mixing of the raw materials. The resulting compound is next calendared into sheets, typically referred to as “preforms.” The preforms are then placed in heated molds where they are pressed into tiles and the materials are vulcanized. After the molding operation, the tiles are sanded to obtain the correct thickness, as well as to enhance adhesion, and then trimmed to their finished size for packaging. Packaging materials include polyethylene film, corrugated cardboard, and wooden pallets.



Schematic of production process

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## Delivery and Installation

In this study, transport to construction site by truck and flooring installation in the building are included. Adhesive is required for installation; 250 g/m<sup>2</sup> are used. During installation, approximately 4.5% of the total material is cut off as waste. Though some of this waste could be recycled, this scrap is modeled as being disposed of in a landfill.

### Health, Safety, and Environmental Aspects during Installation

Installed product waste and packaging waste are assumed to be sent to a landfill (although packaging material is often recycled in local systems). Landfill emissions from paper, plastic, and wood packaging are allocated to installation.

Following installation procedures correctly is critical to meeting the health and safety of workers during installation. Procedures are described on the product Specifications (see document links in section Cleaning and Maintenance.)

## Use Stage

The service life of rubber flooring will vary depending on the amount of foot traffic, furnishing type and use, and the type of equipment used for floor maintenance and frequency of use. The level of maintenance is also dependent on the actual use and desired appearance of the floor. For this product, the defined Reference Service Life (RSL) is 40 years. This means that the product will meet its functional requirements for an average of 40 years before replacement. Since the EPD must present results for both one-year and 60-year time periods, impacts are calculated for both time horizons.

### Cleaning and Maintenance



The recommended cleaning regime is highly dependent on the use of the premises where the floor covering is installed. In high traffic areas, more frequent cleaning will be needed compared to areas where there is low traffic. For the purposes of this EPD, average maintenance is presented based on typical installations as summarized in the list of use and maintenance activities to accompany Table B in the Results section.

Product-specific cleaning regimes can be found here:

<http://www.roppe.com/products/overview/index.html>

Maintenance instructions

### Prevention of Structural Damage

Heavy furniture and equipment should be kept off the floor for a minimum of 72 hours after floor installation to allow the adhesive to set. Damage from wheeled vehicles, castered furniture and dollies can be prevented by using proper furniture rests, wheels or casters with suitable widths and diameters for the loads to be carried.

Moisture in subfloors is an important consideration for the successful installation of rubber flooring. To avoid damage from moisture, recommended guidelines in ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring and ASTM F 1482 Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring should be followed.





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Health Aspects during Use



The flooring products in this EPD comply with the VOC emissions requirements in the California Department of Public Health (CDPH) Standard Method v1.1 as certified by the FloorScore® Certification Program for Indoor Air Quality. The flooring products also meet Collaborative for High Performance Schools (CHPS) criteria. These tests, closed chamber laboratory tests over 14 days, ensure there is no or minimal off-gassing of volatile organic compounds from the Roppe products.

Roppe Rubber Tile is a low maintenance product that does not require waxes or finishes. Low VOC cleaning materials for use in maintaining rubber flooring are available through Roppe.

End of Life

Based on current best information, a small amount of construction waste is incinerated or recycled; for the purposes of this EPD, however, 100% of all flooring removal waste is disposed of in a landfill. (See next section, and Additional Information about Recycling, for actual waste practices.)

Additional Environmental Information (Recycling, Raw Materials, Chemicals of Concern)

**Additional Information about Recycling:** Scrap rubber from the Fostoria, Ohio rubber manufacturing plant is sent to a local manufacturer of rubber truck flaps. More than 500,000 pounds per year (250 tons per year) of rubber scrap have been recycled to this use for the past two years.



In addition, more than 26,180,000 pounds of rubber has been recycled through the IMPACT program in the past five years. IMPACT accepts demolition and renovation waste from projects around the country, Roppe and other flooring rubber products, to make municipal mulch for use in playgrounds, flower beds, etc.



In 2014 and again in 2015, more than 3,000,000 pounds of scrap rubber from Roppe’s Fostoria manufacturing plant and from construction projects using Roppe products were recycled through the IMPACT program.







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**Additional Information about Raw Materials:** In 2015, Roppe Corporation joined the Sustainable Purchasing Leadership Council (SPLC) and uses SPLC guidance in purchasing decisions. In 2014-15, Roppe assisted a key supplier to open a manufacturing plant in Fostoria, Ohio, moving production from S. Korea to the U.S. This action won an Outstanding Case Study Award from the SPLC, for ‘on-shoring.’ For more information, go to <https://www.sustainablepurchasing.org/library/#roppe>.

**Additional Information about Chemicals of Concern:** Roppe Corporation follows the RHC Framework to remove chemicals of concern from all products. For 30 years, Roppe has been a leader in removing hazardous components from building materials including most recently switching to an iron oxide from a copper based yellow pigment with heavy metals in 2007, and switching to epoxidized soybean oil from naphthenic oil in 2012. In 2015, Roppe Corporation joined the Health Product Declaration Collaborative, and is using HPD 2.0 to prioritize work on chemicals of concern and actively participating in HPDC work groups (in 2016, the third party certification technical working group).



A balance between product quality, chemical hazard, and cost is pursued in evaluating raw materials and the production process. Product quality includes durability, aesthetics, ease of maintenance and cleaning—all the aspects of the product that customers rely upon. Chemical hazard includes toxicity, exposure, and concentration of chemicals of concern. Members of the engineering, chemistry, technical & installation services, and sustainability groups are continuously searching out and evaluating new possible materials and processes.

**Corporate Environmental Sustainability Goals:** Corporate environmental sustainability goals for four key metrics have been set for the Roppe Holding Company (RHC) for the period 2016-2025. These metrics and their goals are:

| Metric              | Goal          | Measured as:                                     |
|---------------------|---------------|--|
| Energy Intensity    | 20% reduction | kWh/pound of product                             |
| Greenhouse Gases    | 20% reduction | kg CO <sub>2</sub> -equivalents/pound of product |
| Waste to Landfill   | 20% reduction | Pounds waste/pound of product                    |
| Water Used/Consumed | 20% reduction | Gallons water/pound of product                   |





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## Life Cycle Assessment

A full Life Cycle Assessment has been carried out according to ISO 14040 and 14044, per the Product Category Rule (PCR) for Flooring: Carpet, Resilient, Laminate, Ceramic, Wood – Version 2, as published by NSF International [NSF 2014].

The main purpose of EPDs is for use in business-to-business communication. As all EPDs are publicly available via the Program Operator and therefore are accessible to the end consumer, they can also be used in business-to-consumer communication.

## Functional Unit

The declaration refers to the functional unit of 1m<sup>2</sup> installed flooring.

## Cut-off Criteria

Cut-off criteria were applied in keeping with the PCR. Raw materials each representing 0.5% or less of total incoming raw material mass were cut off, amassing to no more than 2% of the tile product formulation. Ultimately, cumulative omitted mass and environmental impacts remained below 5%, as required by the PCR. For manufacturing, the utilized thermal and electrical energy, the required packaging materials, and all direct production waste were included in the analysis.

## LCA Background Data

As a general rule, specific data derived from specific production processes or average data derived from specific production processes are preferred as the basis for calculating LCA results.

For life cycle modeling of the considered products, the GaBi ts Software System for Life Cycle Engineering, developed by thinkstep AG, was used to model the product systems considered in this assessment [GABI TS 2016]. All relevant background datasets, including those for energy, transportation, and auxiliary materials, were taken from the GaBi 2016 databases. The datasets in the GaBi databases are documented online [GABI TS 2016].

## Data Quality

A variety of tests and checks were performed throughout the project to ensure high quality of the completed project. Checks included an extensive review of project-specific LCA models and background data used.

## Temporal Coverage

Foreground data are based on 2015 averaged data. Background datasets are all based on data from the last 10 years (since 2006), with the majority of datasets based on data from 2012 or later.

## Technological Coverage

Data represent manufacturing of molded rubber flooring at a single Roppe manufacturing facility. Waste, emissions and energy use are based on measured data during the reference year. Raw material inputs in the calculation for this EPD are based on Roppe product formulation, scaled to annual production.

## Geographical Coverage

The analysis represents production at a single US plant in Fostoria, OH. Manufacturing energy inputs are representative for the US region included, but proxy datasets were used as needed for raw material inputs to address



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lack of data for a specific material or for a specific geographical region. These proxy datasets were chosen for their technological representativeness of the actual materials.

## System Boundaries

The EPD system boundary is defined according to the NSF PCR for flooring [NSF 2014]. According to the PCR, the product life cycle is to be divided into five stages:

- Sourcing and extraction,
- Manufacturing,
- Delivery and installation,
- Use, and
- End-of-life.

Impacts and aspects related to wastage (i.e. production, transport and waste processing and end-of-life stage of lost waste products and materials) are considered in the module in which the wastage occurs.

## Allocation

### Co-Product Allocation

No co-product allocation occurs in the product system.

### Multi-Input Processes Allocation

No multi-input allocation occurs in the product system.

### Recovery Allocation

Product and packaging waste is modeled as being disposed in a landfill rather than incinerated or recycled. Plastic and other construction waste is assumed to be inert in landfills, so no system expansion or allocation is necessary as landfill gas is not produced. In the case of bio-based packaging waste disposed during installation, landfill gas from the decomposition of this waste can be collected and used to produce electricity. Following the cut-off approach, however, no energy credits or offsets are given.





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Results

Life Cycle Impact Assessment

Per the guiding PCR, Table A discloses the total potential impacts associated with the activities necessary to bring 1 m<sup>2</sup> of product to market and includes end-of-life impacts, regardless of the amount of time that the product is used by the customer.

Table A: Life cycle stage impacts, Cradle to Install and End-of-Life for 1 m<sup>2</sup> flooring

| Impact Category                         | Units                                 | Sourcing and Extraction | Manu- facturing | Delivery and Installation | End-of-Life | TOTAL           |
|---|---------------------------------------|-------------------------|-----------------|---------------------------|-------------|-----------------|
| Abiotic Depletion Potential, Elements*  | kg Sb-eq.                             | 0.000118                | 2.00E-06        | 1.74E-06                  | 9.01E-08    | <b>0.000122</b> |
| Abiotic Depletion Potential, Fossil*    | MJ                                    | 269                     | 126             | 17.9                      | 3.69        | <b>416</b>      |
| Acidification Potential*                | kg SO <sub>2</sub> -eq.               | 0.0234                  | 0.0289          | 0.00331                   | 0.00318     | <b>0.0588</b>   |
| Eutrophication Potential*               | kg PO <sub>4</sub> <sup>3-</sup> -eq. | 0.00538                 | 0.00174         | 0.00123                   | 0.0014      | <b>0.00976</b>  |
| Global Warming Potential*               | kg CO <sub>2</sub> -eq.               | 11.1                    | 10.1            | 1.43                      | 0.242       | <b>22.9</b>     |
| Ozone Depletion Potential*              | kg R11-eq.                            | 4.22E-10                | 3.54E-09        | 4.97E-11                  | 4.51E-12    | <b>4.01E-09</b> |
| Photochemical Ozone Creation Potential* | kg Ethene-eq.                         | 0.00349                 | 0.00188         | 0.000628                  | 0.00145     | <b>0.00744</b>  |
| Primary Energy Demand, Non-Renewable**  | MJ                                    | 273                     | 157             | 18.4                      | 3.78        | <b>453</b>      |
| Primary Energy Demand, Renewable**      | MJ                                    | 9.39                    | 10.7            | 0.368                     | 0.228       | <b>20.7</b>     |

\* CML 2001 – April 2015    \*\* Impact indicators

Per the guiding PCR, Table B discloses the average 1-year potential impacts associated with product use and maintenance.

Table B: Average one year Use stage impacts for 1 m<sup>2</sup> flooring

| Impact Category                         | Units                                 | Average 1 year Use and Maintenance Impacts |
|---|---------------------------------------|--|
| Abiotic Depletion Potential, Elements*  | kg Sb-eq.                             | 7.56E-08                                   |
| Abiotic Depletion Potential, Fossil*    | MJ                                    | 1.5  |
| Acidification Potential*                | kg SO <sub>2</sub> -eq.               | 0.000189                                   |
| Eutrophication Potential*               | kg PO <sub>4</sub> <sup>3-</sup> -eq. | 0.000187                                   |
| Global Warming Potential*               | kg CO <sub>2</sub> -eq.               | 0.0922                                     |
| Ozone Depletion Potential*              | kg R11-eq.                            | 0.0000383                                  |
| Photochemical Ozone Creation Potential* | kg Ethene-eq.                         | 9.34E-12                                   |
| Primary Energy Demand, Non-Renewable**  | MJ                                    | 1.59                                       |
| Primary Energy Demand, Renewable**      | MJ                                    | 0.0494                                     |

\* CML 2001 – April 2015    \*\* Impact indicators

List of Use and Maintenance Activities to accompany Table B

| Maintenance Activity       | Frequency over user defined 40-year service life of product | Annual consumption of energy and resources                               |
|----------------------------|---|--|
| Dry mop                    | 40 x 365 times (daily)                                      | -  |
| Damp mop / neutral cleaner | 40 x 52 times (weekly)                                      | Neutral detergent: 119 ml/m <sup>2</sup><br>Water: 5.8 L/m <sup>2</sup>  |
| Buff                       | 40 x 12 times (monthly)                                     | Finish: 0.12 L / m <sup>2</sup><br>Electricity: 0.022 kWh/m <sup>2</sup> |





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Per the guiding PCR, Table C discloses the total potential impacts associated with all stages of the product, including use stage, over the entire life of a building. The building reference service life (RSL) is defined as 60 years. The user-defined product RSL is 40 years.

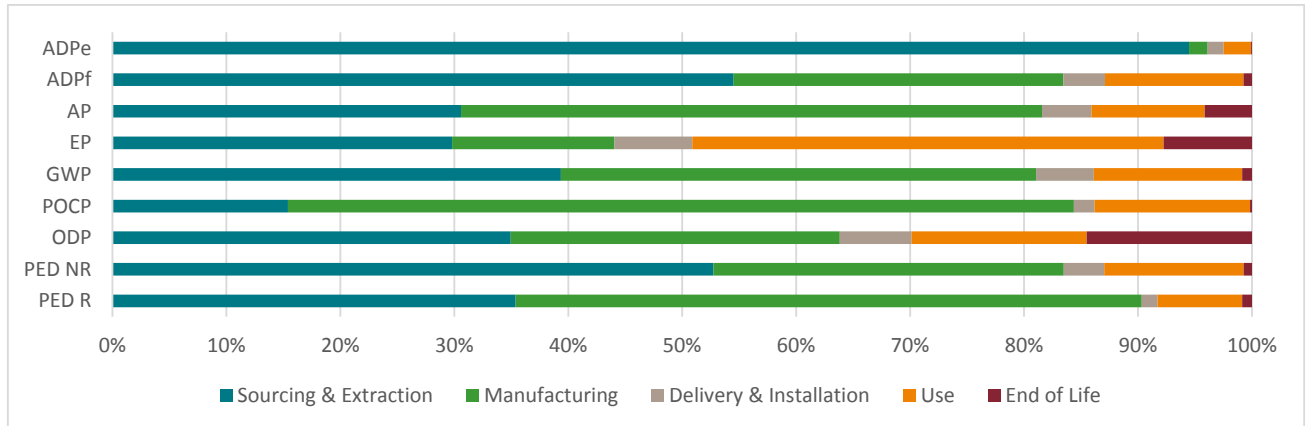
**Table C: Life cycle stage impacts, Cradle-to-Grave impacts over the 60-year building service life for 1m<sup>2</sup> flooring**

| Impact Category                         | User defined RSL of product = 40 years<br>Number of installations over 60 years = 1.5 |                         |                 |                           |          |              |                 |
|---|---|-------------------------|-----------------|---------------------------|----------|--------------|-----------------|
|   | Units   | Sourcing and Extraction | Manu- facturing | Delivery and Installation | Use      | End-of- Life | TOTAL           |
| Abiotic Depletion Potential, Elements*  | kg Sb-eq.   | 0.000177                | 3.01E-06        | 2.62E-06                  | 4.53E-06 | 1.35E-07     | <b>0.000188</b> |
| Abiotic Depletion Potential, Fossil*    | MJ  | 403                     | 189             | 26.9                      | 89.9     | 5.53         | <b>714</b>      |
| Acidification Potential*                | kg SO <sub>2</sub> -eq.   | 0.0351                  | 0.0434          | 0.00497                   | 0.0114   | 0.00477      | <b>0.0996</b>   |
| Eutrophication Potential*               | kg PO <sub>4</sub> <sup>3-</sup> -eq.   | 0.00807                 | 0.00262         | 0.00185                   | 0.0112   | 0.0021       | <b>0.0259</b>   |
| Global Warming Potential*               | kg CO <sub>2</sub> -eq.   | 16.7                    | 15.1            | 2.15                      | 5.53     | 0.363        | <b>39.9</b>     |
| Ozone Depletion Potential*              | kg R11-eq.  | 6.32E-10                | 5.31E-09        | 7.46E-11                  | 5.6E-10  | 6.77E-12     | <b>6.58E-09</b> |
| Photochemical Ozone Creation Potential* | kg Ethene-eq.   | 0.00523                 | 0.00282         | 0.000942                  | 0.0023   | 0.00217      | <b>0.0135</b>   |
| Primary Energy Demand, Non-Renewable**  | MJ  | 410                     | 236             | 27.6                      | 95.1     | 5.67         | <b>774</b>      |
| Primary Energy Demand, Renewable**      | MJ  | 14.1                    | 16.1            | 0.553                     | 2.96     | 0.343        | <b>34</b>       |

\* CML 2001 – April 2015    \*\* Inventory indicators

**Interpretation**

The diagram below offers a view of the results in Table C, normalized to 100%.



**Normalized impacts, broken up into the five life cycle stages**

Over the 60-year life of an installation in a building, the upstream production of raw materials, the manufacturing of the flooring product, and the recommended maintenance during use represent the largest contributors in each impact category considered. Use-phase eutrophication potential is largely driven by municipal wastewater treatment.





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RESILIENT FLOORING

According to ISO 14025

## References

|              |   |
|--------------|---|
| GABI TS 2016 | thinkstep AG; GaBi ts: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, Echterdingen, 1992-2016.                        |
| EN 15804     | EN 15804:2012-02 Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products |
| ISO 14025    | ISO 14025:2011-10 Environmental labels and declarations - Type III environmental declarations - Principles and procedures                                 |
| ISO 14040    | ISO 14040:2009-11 Environmental management - Life cycle assessment - Principles and framework   |
| ISO 14044    | ISO 14044:2006-10 Environmental management - Life cycle assessment - Requirements and guidelines  |
| NSF 2014     | NSF Product Category Rule for Flooring: Carpet, Resilient, Laminate, Ceramic, Wood – Version 2  |

## Contact Information

### Study Commissioner



Please call us with any question about Roppe rubber tile products or this Environmental Product Declaration. Thank you for your business, for more than 60 years.

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