Environmental Product Declaration
according to ISO 14025 and EN 15804

This declaration is for:
Kerdyn Green FR structural PET foam

Provided by:
Gurit Italy

program operator
Stichting MRPI®
publisher
Stichting MRPI®
www.mrpi.nl

MRPI® registration
1.1.00093.2019
EPD registration
00001130
date of first issue
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date of this issue
17-02-2020
expiry date
17-02-2025
PROGRAM OPERATOR
Stichting MRPI®
Kingsfordweg 151
1043GR
Amsterdam

COMPANY INFORMATION
Gurit
Gurit Italy
Via Torino 103
10088
Volpiano (TO), Italy
0039 011 995 28 81

www.gurit.com

SCOPE OF DECLARATION
This MRPI®-EPD certificate is verified by Niels Jonkers, Ecochain Technologies.
The LCA study has been done by Martijn van Hövell, SGS Search Consultancy.
The certificate is based on an LCA-dossier according to ISO14025 and NEN-EN15804+A1. It is verified according to the 'EPD-MRPI® verification protocol May 2017.v3.1'. EPDs of construction products may not be comparable if they do not comply with NEN-EN15804+A1. Declaration of SVHC that are listed on the 'Candidate List of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

VISUAL PRODUCT

DESCRIPTION OF PRODUCT
Gurit® Kerdyn™ Green FR is a stable structural core material with good fire, smoke and toxicity (FST) properties. Based on PET technology, allowing high-recycled product content.

MORE INFORMATION
www.gurit.com

DEMONSTRATION OF VERIFICATION
CEN standard EN15804 serves as the core PCR[a]
Independent verification of the declaration and data, according to EN ISO 14025:2010:
internal: X
(where appropriate[b]) Third party verifier:
Niels Jonkers, Ecochain

DETAILED PRODUCT DESCRIPTION
Gurit® Kerdyn™ Green FR foam is extruded using up to 100% processed recycled PET bottles as a raw material. The foam is further treated to obtain blocks of dimensions 1005 x 1250 x 2440 mm which are then sliced to thicknesses varying from 5 to 100 mm.

Sliced panels are stacked on pallets, wrapped with cardboard and PE-film as well as tied together with a PET strap, in preparation to shipping to customers.

Thus, Kerdyn Green FR is available in panels with various thicknesses and densities. All the fire retardant range of densities is covered in this EPD: densities 80, 115, and 180 kg/m³ are included.

COMPONENT (> 1%) [kg / %]

| Composition classified | ---- |
| (*) > 1% of total mass |

SCOPE AND TYPE
The geographical location is Italy and the product is manufactured in Volpiano, Italy. The product has various potential applications as a construction material or as a component in construction materials. Background database used for the calculations is Ecoinvent version 3.5 in combination with the SimaPro 9.0 LCA software. The EPD is a "Cradle to gate with options" EPD. The EPD is a specific EPD for a specific product.

PRODUCT STAGE | CONSTRUCTION | USE STAGE | END OF LIFE | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
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X = Module assessed
MNA = Module not assessed

REPRESENTATIVENESS
Not applicable
## ENVIRONMENTAL IMPACT per functional unit or declared unit

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### Toxicity indicators (Dutch market)

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### Environmental Cost Indicator (Dutch market)

| ECI      | Euro | IN  | IN  | IN  | IN  | IN  | IN  | IN  | IN  | IN  | IN  | IN  | IN  | IN  | IN  | IN  | IN  | IN  |

INA = Indicator Not Assessed  
ADPE = Abiotic Depletion Potential for non-fossil resources  
ADPF = Abiotic Depletion Potential for fossil resources  
GWP = Global Warming Potential  
ODP = Depletion potential of the stratospheric ozone layer  
POCP = Formation potential of tropospheric ozone photochemical oxidants  
AP = Acidification Potential of land and water  
EP = Eutrophication Potential  
HTP = Human Toxicity Potential  
FAETP = Fresh water aquatic ecotoxicity potential  
MAETP = Marine aquatic ecotoxicity potential  
TETP = Terrestrial ecotoxicity potential  
ECI = Environmental Cost Indicator
### RESOURCE USE per functional unit or declared unit

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INA = Indicator Not Assessed  
PERE = Use of renewable energy excluding renewable primary energy resources  
PERM = Use of renewable energy resources used as raw materials  
PERT = Total use of renewable primary energy resources  
PENRE = Use of non-renewable primary energy resources excluding non-renewable 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 resources  
SM = Use of secondary materials  
RSF = Use of renewable secondary fuels  
NRSF = Use of non renewable secondary fuels  
FW = Use of net fresh water

### OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit

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INA = Indicator Not Assessed  
HWD = Hazardous Waste Disposed  
NHWD = Non Hazardous Waste Disposed  
RWD = Radioactive Waste Disposed  
CRU = Components for reuse  
MFR = Materials for recycling  
MER = Materials for energy recovery  
EEE = Exported Electrical Energy  
ETE = Exported Thermal Energy

**CALCULATION RULES**

Declared unit is one m³ squared blocks. Results are presented for the KG080FR and can be scaled to the various densities and thicknesses of panels. End-of-life scenarios are included separately and are calculated per kg product.

*Cut off rules*

All relevant and known processes and materials have been included. The following modules and processes have been excluded from the system boundary:

- Maintenance and operation of support equipment except those included in Ecoinvent background processes;
- Capital goods and infrastructure (except those included in Ecoinvent background processes).

There is no reason to believe that relevant in- or outputs are excluded from this study.

*Data collection and quality*

Data is retrieved from a Bill of Materials (BoM) supplied by Gurit. There are no inconsistencies found in the data and there is no reason to believe that data is incomplete or not reliable.

Since the process is new and the start-up phase is considered not representative due to process optimisation in this phase, data from the period January-August 2019 is used.

Data about the production of the PET granulate and the composition of the additives are supplied by the suppliers of the materials and substances. Communication with suppliers went via Gurit.
### ENVIRONMENTAL IMPACT per kg of product: incineration

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**Toxicity indicators (Dutch market)**

| HTP      | kg DCB-eq. | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN |
| FAETP    | kg DCB-eq. | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN |
| MAETP    | kg DCB-eq. | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN |
| TETP     | kg DCB-eq. | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN |

**Environmental Cost Indicator (Dutch market)**

| ECI      | Euro | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN | IN |

**Notes:**
- INA = Indicator Not Assessed
- ADPE = Abiotic Depletion Potential for non-fossil resources
- ADPF = Abiotic Depletion Potential for fossil resources
- GWP = Global Warming Potential
- ODP = Depletion potential of the stratospheric ozone layer
- POCP = Formation potential of tropospheric ozone photochemical oxidants
- AP = Acidification Potential of land and water
- EP = Eutrophication Potential
- HTP = Human Toxicity Potential
- FAETP = Fresh water aquatic ecotoxicity potential
- MAETP = Marine aquatic ecotoxicity potential
- TETP = Terrestrial ecotoxicity potential
- ECI = Environmental Cost Indicator

**Source:**
### RESOURCE USE per kg of product: incineration

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IN = Indicator Not Assessed  
PERE = Use of renewable energy excluding renewable primary energy resources  
PERM = Use of renewable energy resources used as raw materials  
PERT = Total use of renewable primary energy resources  
PENRE = Use of non-renewable primary energy resources excluding non-renewable 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 resources  
SM = Use of secondary materials  
RSF = Use of renewable secondary fuels  
NRSF = Use of non renewable secondary fuels  
FW = Use of net fresh water

### OUTPUT FLOWS AND WASTE CATEGORIES per kg of product: incineration

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IN = Indicator Not Assessed  
HWD = Hazardous Waste Disposed  
NHWD = Non Hazardous Waste Disposed  
RWD = Radioactive Waste Disposed  
CRU = Components for reuse  
MFR = Materials for recycling  
MER = Materials for energy recovery  
EEE = Exported Electrical Energy  
ETE = Exported Thermal Energy
### ENVIRONMENTAL IMPACT per kg of product: landfill

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#### Toxicity indicators (Dutch market)

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#### Environmental Cost Indicator (Dutch market)

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INA = Indicator Not Assessed
ADPE = Abiotic Depletion Potential for non-fossil resources
ADPF = Abiotic Depletion Potential for fossil resources
GWP = Global Warming Potential
ODP = Depletion potential of the stratospheric ozone layer
POCP = Formation potential of tropospheric ozone photochemical oxidants
AP = Acidification Potential of land and water
EP = Eutrophication Potential
HTP = Human Toxicity Potential
FAETP = Fresh water aquatic ecotoxicity potential
MAETP = Marine aquatic ecotoxicity potential
TETP = Terrestrial ecotoxicity potential
ECI = Environmental Cost Indicator
### RESOURCE USE per kg of product: landfill

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INA = Indicator Not Assessed

- PERE = Use of renewable energy excluding renewable primary energy resources
- PERM = Use of renewable energy resources used as raw materials
- PERT = Total use of renewable primary energy resources
- PENRE = Use of non-renewable primary energy resources excluding non-renewable 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 resources
- SM = Use of secondary materials
- RSF = Use of renewable secondary fuels
- NRSF = Use of non renewable secondary fuels
- FW = Use of net fresh water

### OUTPUT FLOWS AND WASTE CATEGORIES per kg of product: landfill

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INA = Indicator Not Assessed

- HWD = Hazardous Waste Disposed
- NHWD = Non Hazardous Waste Disposed
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- CRU = Components for reuse
- MFR = Materials for recycling
- MER = Materials for energy recovery
- EEE = Exported Electrical Energy
- ETE = Exported Thermal Energy
### ENVIRONMENTAL IMPACT per kg of product: recycling

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**Toxicity indicators (Dutch market)**

| HTP | kg DCB-eq. | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| FAETP | kg DCB-eq. | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| MAETP | kg DCB-eq. | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| TETP | kg DCB-eq. | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |

**Environmental Cost Indicator (Dutch market)**

| ECI | Euro | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA | INA |

INA = Indicator Not Assessed
ADPE = Abiotic Depletion Potential for non-fossil resources
ADPF = Abiotic Depletion Potential for fossil resources
GWP = Global Warming Potential
ODP = Depletion potential of the stratospheric ozone layer
POCP = Formation potential of tropospheric ozone photochemical oxidants
AP = Acidification Potential of land and water
EP = Eutrophication Potential
HTP = Human Toxicity Potential
FAETP = Fresh water aquatic ecotoxicity potential
MAETP = Marine aquatic ecotoxicity potential
TETP = Terrestrial ecotoxicity potential
ECI = Environmental Cost Indicator
### RESOURCE USE per kg of product: recycling

<table>
<thead>
<tr>
<th>UNIT</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A1-A3</th>
<th>A4</th>
<th>A5</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
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<th>B6</th>
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</table>

INA = Indicator Not Assessed  
PERE = Use of renewable energy excluding renewable primary energy resources  
PERM = Use of renewable energy resources used as raw materials  
PERT = Total use of renewable primary energy resources  
PENRE = Use of non-renewable primary energy resources excluding non-renewable 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 resources  
SM = Use of secondary materials  
RSF = Use of renewable secondary fuels  
NRSF = Use of non renewable secondary fuels  
FW = Use of net fresh water

### OUTPUT FLOWS AND WASTE CATEGORIES per kg of product: recycling

<table>
<thead>
<tr>
<th>UNIT</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A1-A3</th>
<th>A4</th>
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<td>0.00</td>
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</tbody>
</table>

INA = Indicator Not Assessed  
HWD = Hazardous Waste Disposed  
NHWD = Non Hazardous Waste Disposed  
RWD = Radioactive Waste Disposed  
CRU = Components for reuse  
MFR = Materials for recycling  
MER = Materials for energy recovery  
EEE = Exported Electrical Energy  
ETE = Exported Thermal Energy
SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

Results are presented are for the KG080 FR version and can be scaled for various densities. An overview of the options is displayed in the table below.

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<tr>
<th>Product</th>
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<td>KG180FR</td>
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</table>

Results are presented in m³ and can be scaled according to their thickness. The options for thickness of the panels are included below and calculated by volume. Production waste is to be included when calculating a certain thickness.

<table>
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<tr>
<th>Thickness (mm)</th>
<th>m³ material</th>
<th>m³ production waste</th>
<th>m³ total</th>
</tr>
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<tbody>
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<td>200.0</td>
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<td>12.0</td>
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</table>

A1. Raw materials supply
This module considers the extraction and processing of all raw materials and energy which occur upstream to the Kerdyn Green FR manufacturing process, as well as waste processing up to the end-of waste state.

A2. Transport of raw materials to manufacturer
This includes the transport distance of the raw materials to the manufacturing facility via road, boat and/or train.

A3. Manufacturing
This module covers the manufacturing of Kerdyn Green FR and includes all processes linked to production such as storing, mixing, packing and internal transportation. Use of electricity and fuels production are taken into account as well as direct emissions from production process. The manufacturing of production equipment and infrastructure is not included in the system boundary, unless it is included in Ecoinvent background processes. Packaging-related flows in the production process and all up-stream packaging are included in the manufacturing module. The manufacturing process takes place at one production site. For upstream (raw material processes) and downstream processes (waste processing) generic data is used when no specific data is obtained.
DECLARATION OF SVHC
None of the substances contained in the product are listed in the “Candidate List of Substances of Very High Concern for authorisation”, or they do not exceed the threshold with the European Chemicals Agency.

REFERENCES

REMARKS
None