

Statement of Verification

BREG EN EPD No.: 000422

Issue 02

This is to verify that the
Environmental Product Declaration
 provided by:
Gradus Ltd



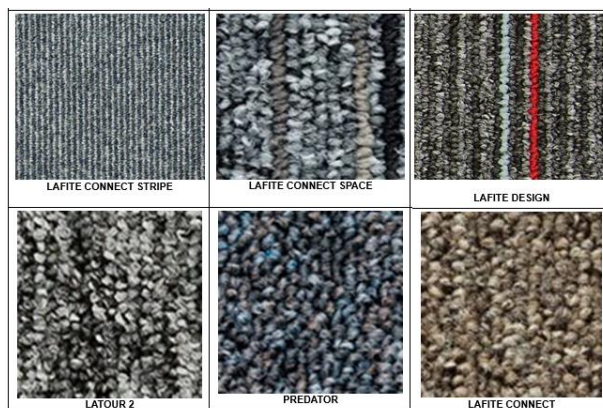
is in accordance with the requirements of:
EN 15804:2012+A1:2013

and
BRE Global Scheme Document SD207

This declaration is for:
1m² Lafite Connect Loop Pile Tufted Bitumen Backed Carpet Tile

Company Address

Park Green
 Macclesfield
 Cheshire
 SK11 7LZ



GRADUS

Signed for BRE Global Ltd

Emma Baker
 Operator

05 October 2023
 Date of this Issue

06 June 2022
 Date of First Issue

05 June 2027
 Expiry Date



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Environmental Product Declaration

EPD Number: 000422

General Information

| EPD Programme Operator | Applicable Product Category Rules |
|---|---|
| BRE Global Watford, Herts WD25 9XX United Kingdom | BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013 |
| Commissioner of LCA study | LCA consultant/Tool |
| Gradus Ltd Park Green Macclesfield Cheshire SK11 7LZ | Andrew Dutfield/BRE LINA v2.0 |
| Declared Unit | Applicability/Coverage |
| 1m ² (4.415 kg/m ²) Lafite Connect loop pile tufted bitumen backed carpet tile | Product Average. |
| EPD Type | Background database |
| Cradle to Gate | ecoinvent v3.2 |
| Demonstration of Verification | |
| CEN standard EN 15804 serves as the core PCR ^a | |
| Independent verification of the declaration and data according to EN ISO 14025:2010 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External | |
| (Where appropriate ^b)Third party verifier: Nigel Jones | |
| a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4) | |
| Comparability | |
| Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A1:2013 for further guidance | |

Information modules covered

| Product | | | Construction | | Use stage | | | | | | | End-of-life | | | | Benefits and loads beyond the system boundary |
|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|-----------------------------|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------------------|--------------------------|--------------------------|--------------------------|---|
| A1 | A2 | A3 | A4 | A5 | Related to the building fabric | | | | Related to the building | | | C1 | C2 | C3 | C4 | D |
| Raw materials supply | Transport | Manufacturing | Transport to site | Construction – Installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction demolition | Transport | Waste processing | Disposal | Reuse, Recovery and/or Recycling potential |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

3 First Avenue
Poynton Industrial Estate
Poynton
Cheshire
SK12 1YJ

Winsford Industrial Estate
Winsford
Cheshire
CW7 3QB

Construction Product:

Product Description

Lafite Connect features a range of complementary designs (Plains, Stripes, Design and Space) that can work together to create interesting and contemporary floor schemes. Lafite Connect yarn is complementary and blended across each design providing creativity and flexibility.

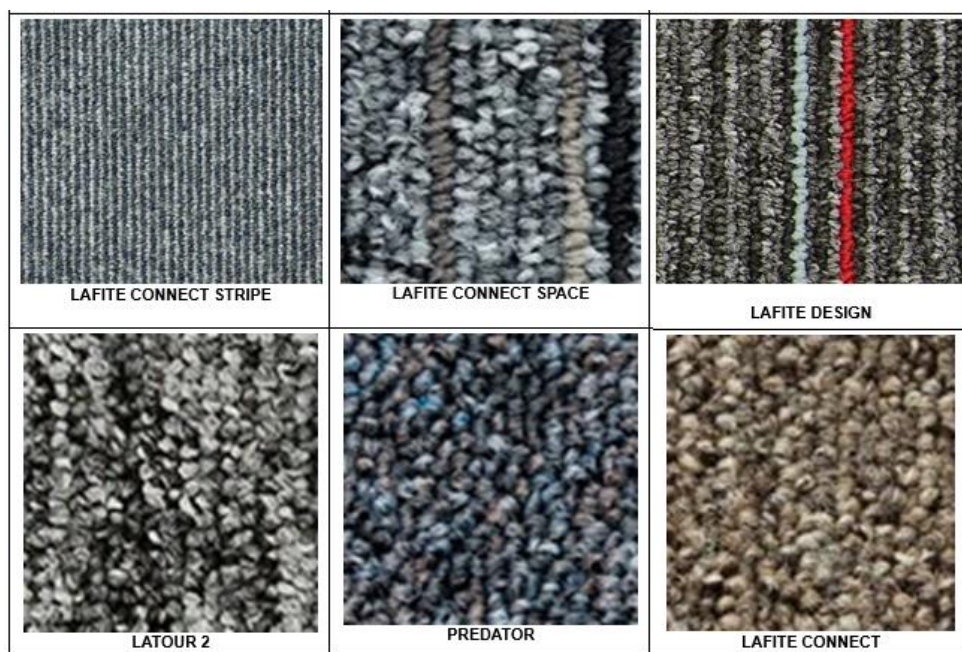
Predator is a durable loop pile carpet available in tile format. It offers a stylish, hard wearing solution, suitable for most commercial environments. Latour² comprises Plains and Stripes which can be used alone or can work together to create interesting and unique floor schemes. Latour² is suitable for a wide range of environments including commercial and education.

The following products are included in this EPD:

| Product | Pile weight (g/m ²) | Total product weight (g/m ²) |
|---|---------------------------------|--|
| Lafite Connect/ Connect Stripes/ Design (solution dyed) | 540 | 4,415 |
| Lafite Connect Space (solution & space dyed) | 540 | 4,415 |
| Predator (solution dyed) | 525 | 4,400 |
| Lafite (solution dyed) | 500 | 4,375 |
| Latour ² (solution dyed) | 470 | 4,320 |

Technical Information

| Property | Value, Unit (Lafite Connect) | Value, Unit (Latour ²) | Value, Unit (Predator) |
|--------------------------------------|------------------------------|------------------------------------|------------------------|
| Wear Class Classification BS EN 1307 | 33 | 33 | 33 |
| Castor Chair BS EN 985 Part A | Pass | Pass | Pass |
| Static Electricity ISO 6356 | <2 kV | <2 kV | <2 kV |
| Flammability BS EN 13501-1 | Class Bfl-s1 | Class Bfl-s1 | Class Bfl-s1 |
| Impact Noise Rating ISO 140-8 | - | - | 23 dB |
| Sound Absorption ISO 354 | - | - | Class E |



Main Product Contents

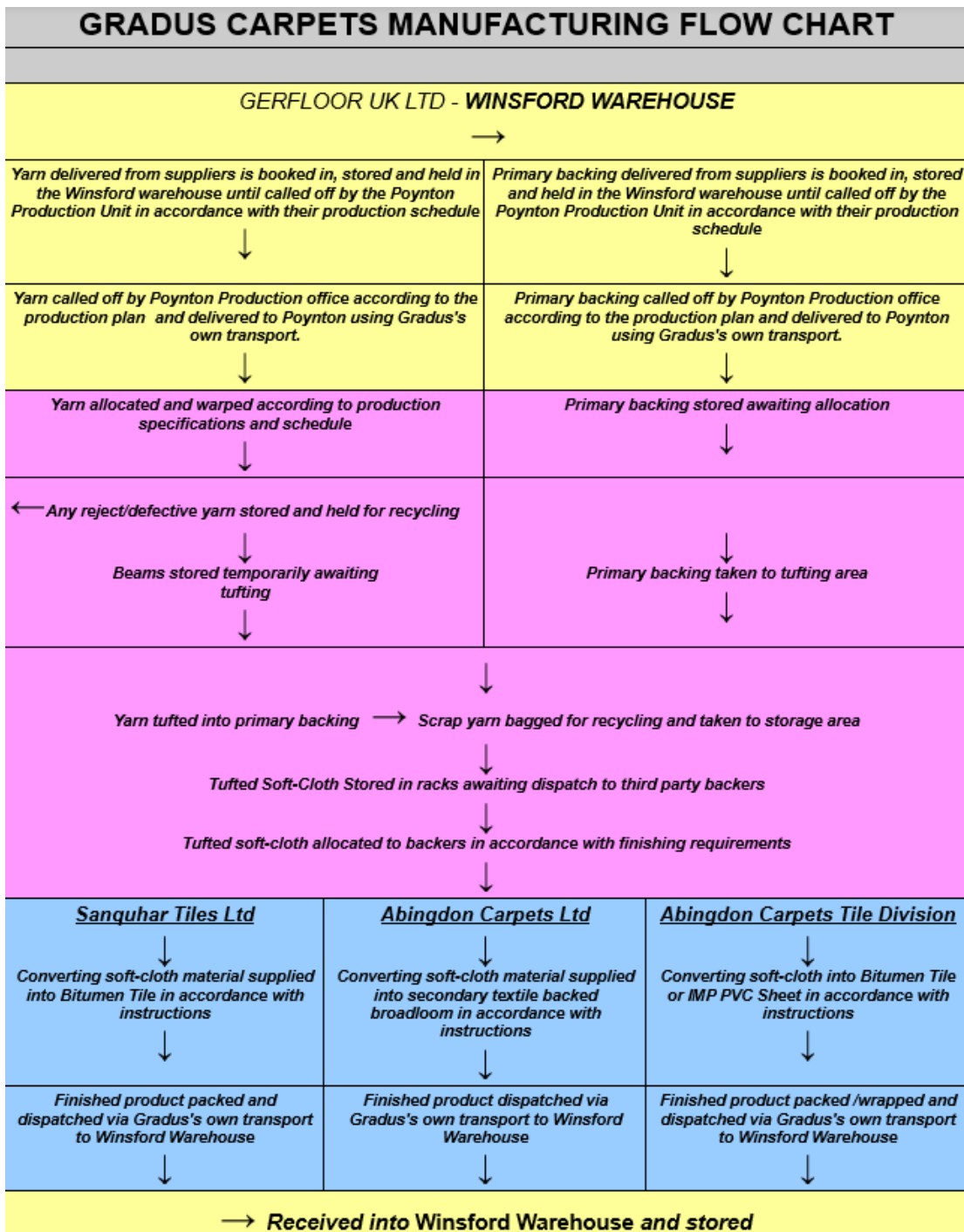
| Material/Chemical Input | % |
|-------------------------|------|
| Nylon 6 yarn | 12.2 |
| Primary backing | 2.0 |
| Bitumen backing | 85.7 |

Manufacturing Process

Gradus Carpets manufactures a range of contract carpets from Nylon and Polypropylene pile yarns. Their own manufacturing facilities includes warehousing, yarn preparation (warping and beaming), along with a range of tufting machines. They operate from their production unit in Poynton, Cheshire with a shared group warehouse facility in Winsford, Cheshire. Yarn and primary backings are received from their suppliers which is delivered into Winsford, and from which they draw these off according to their production schedule. Yarns and primary backings are allocated and delivered into Poynton in the amounts required and checked and prepared

to be converted into soft-cloth product. The required yarns for specific products are warped and held on beams ready for tufting. In accordance with the manufacturing specification and production schedule, the carpet is tufted and the soft-cloth rolls stored on racks until finishing is required. Gradus Carpets works with third party finishers to back their tufted cloth and to convert it into either Bitumen backed tiles, Impervious PVC sheet or Textile secondary backed broadloom carpet.

Process flow diagram



Construction Installation

Carpet tiles should be removed from their boxes and conditioned on site for at least 24 hours before fitting. An arrow on the back of the tile indicates the pile direction. Tiles can be laid with the arrows in the same direction to create a broadloom effect or in a chequer board effect by laying tiles at right angles to each other. Before setting out for the installation, it is essential to ensure that the sub floor is clean, dry, level, smooth and free from contaminants. To obtain a high standard of installation it is necessary to plan your setting out carefully. The correct starting point for setting out is the centre of the area to be tiled. It should be noted however that the final starting point for the installation might be offset from the centre line to ensure the correct size and balance of the side cuts.

Use Information

It is recommended to vacuum daily to remove surface soil using a heavy duty upright vacuum cleaner with a brush or a tub vacuum cleaner with a power head.

To maintain a good visible standard, the carpet will require deep cleaning on a weekly / monthly / as required basis (depending on weather conditions and volume of traffic). Deep cleaning can be carried out using various methods, depending on equipment availability.

In all cases, deep cleaning must follow brushing and vacuuming. Attention must be given to stains by using a pre-treatment of carpet spot and stain remover and chewing gum remover if required.

A) Preferred method: The use of a conventional jet extraction machine, using a conventional floor tool, scrubbing the carpet and continuing to extract as much water as possible. This method leaves the carpet as dry as possible.

B) Deep Soiled Matting: As with all other maintenance methods, always prepare the carpet by vacuum cleaning prior to treatment. The cleaning professional may consider a combination of a rotary scrubbing machine fitted with a carpet brush and extraction equipment to get improved results.

End of Life

Although Gradus does not operate a collection and disposal policy for the End-of-Life of its product range, its various sheet and tile products can be easily disposed of through three main disposal routes, namely Landfill, Municipal Waste Incineration (MWI) and recycling in the cement industry.

In each of these scenarios, the product may be disposed of either intact or by partial separation for which the product is separated down into its main input materials with some or all of them recycled.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1m² (4.415 kg/m²) Lafite Connect loop pile tufted bitumen backed carpet tile

System boundary

This is a cradle-to-gate LCA, reporting all production life cycle stages of modules A1 to A3 in accordance with EN 15804:2012+A1:2013.

Data sources, quality and allocation

The Lafite Connect loop pile carpet declared unit is 1 m² of product with a weight of 4.415 kg/m². The Lafite Connect loop pile product has been chosen to represent all products in the group as a worst-case scenario as it has a higher pile weight and total product weight per m².

The carpet manufacturing data supplied relates to the Poynton and Winsford sites and covers the working period 1st January to 31st December 2020. Poynton is the main manufacturing site and Winsford is the storage

warehouse. The Poynton site manufactures other products in addition to Lafite Connect loop pile. Allocations have been made according to the following table, and according to the provisions of the BRE PCR PN514 and EN 15804 standard:

| | |
|----------------------|---|
| Raw materials | Production by mass x % of product formulation |
| Packaging | % of total production by m ² |
| Energy, water, waste | % of total production by m ² |

Energy and water usage at Winsford have also been additionally allocated at 41% of total usage based on the area taken up by Gerflor products within the facility.

The Bitumen tile backing is applied by various other manufacturers. A generic dataset has been created based on data supplied by TFI for the Green Guide in 2007 to represent the bitumen application process used for this study. Allocations have been made on a per m² basis according to the provisions of the BRE PCR PN514 and EN 15804 standard. Average transport distances of soft cloth from Poynton to the backing plants and of backed carpet from the backing plants to Winsford have been included. Average quantities and transport distances of packing materials have also been calculated for the finished products from data previously supplied by the backing plants.

Secondary data have been drawn from the BRE LINA database v2.0.87 and the background LCI datasets are based on ecoinvent v3.2 (2015).

| Quality Level | Geographical representativeness | Technical representativeness | Time representativeness |
|---------------|---------------------------------|---|---|
| Very Good | Data from area under study | Data from processes and products under study. Same state of technology applied as defined in goal and scope (i.e. identical technology) | n/a |
| Fair | n/a | n/a | Less than 10 years of difference between the reference year according to the documentation, and the time period for which data are representative |

The quality level of geographical and technical representativeness is Very Good. The quality level of time representativeness is Fair as the background LCI datasets are based on ecoinvent v3.2 which was compiled in 2015, and so there is less than 10 years between the reference year according to the documentation, and the time period for which data are representative.

Cut-off criteria

All raw materials and energy input to the manufacturing process have been included, except for direct emissions to air, water and soil, which are not measured. The inventory process in this LCA includes all data related to raw material, packaging material, ancillary and consumable items. Process energy, water use, water discharge and waste are included.

LCA Results

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts | | | GWP | ODP | AP | EP | POCP | ADPE | ADPF |
|---|--------------------------|------|---------------------------|------------------|---------------------------|--|---|--------------|--------------------------|
| | | | kg CO ₂ equiv. | kg CFC 11 equiv. | kg SO ₂ equiv. | kg (PO ₄) ³⁻ equiv. | kg C ₂ H ₄ equiv. | kg Sb equiv. | MJ, net calorific value. |
| Product stage | Raw material supply | A1 | 9.05E+00 | 7.40E-07 | 4.05E-02 | 1.23E-02 | 5.47E-03 | 6.00E-05 | 1.69E+02 |
| | Transport | A2 | 4.00E-01 | 7.37E-08 | 1.35E-03 | 3.54E-04 | 2.34E-04 | 1.05E-06 | 6.05E+00 |
| | Manufacturing | A3 | 8.93E-02 | 2.27E-08 | 1.37E-03 | 8.66E-04 | 3.72E-04 | 9.31E-07 | 5.23E+00 |
| | Total (of product stage) | A1-3 | 9.54E+00 | 8.36E-07 | 4.32E-02 | 1.35E-02 | 6.07E-03 | 6.19E-05 | 1.80E+02 |

GWP = Global Warming Potential;
 ODP = Ozone Depletion Potential;
 AP = Acidification Potential for Soil and Water;
 EP = Eutrophication Potential;

POCP = Formation potential of tropospheric Ozone;
 ADPE = Abiotic Depletion Potential – Elements;
 ADPF = Abiotic Depletion Potential – Fossil Fuels;

| Parameters describing resource use, primary energy | | | PERE | PERM | PERT | PENRE | PENRM | PENRT |
|--|--------------------------|------|----------|----------|----------|----------|----------|----------|
| | | | MJ | MJ | MJ | MJ | MJ | MJ |
| Product stage | Raw material supply | A1 | 4.42E+00 | 6.51E-02 | 4.48E+00 | 1.52E+02 | 2.02E+01 | 1.72E+02 |
| | Transport | A2 | 8.04E-02 | 2.99E-07 | 8.04E-02 | 6.01E+00 | 0.00E+00 | 6.01E+00 |
| | Manufacturing | A3 | 3.28E+00 | 1.34E-06 | 3.28E+00 | 5.94E+00 | 0.00E+00 | 5.94E+00 |
| | Total (of product stage) | A1-3 | 7.77E+00 | 6.51E-02 | 7.84E+00 | 1.63E+02 | 2.02E+01 | 1.84E+02 |

PERE = Use of renewable primary energy excluding renewable primary energy 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 resource

Parameters describing resource use, secondary materials and fuels, use of water

| | | | SM | RSF | NRSF | FW |
|---------------|--------------------------|------|----------|---------------------------|---------------------------|----------------|
| | | | kg | MJ net calorific value | MJ net calorific value | m ³ |
| Product stage | Raw material supply | A1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.06E-01 |
| | Transport | A2 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.31E-03 |
| | Manufacturing | A3 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.45E-03 |
| | Total (of product stage) | A1-3 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.10E-01 |

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

Other environmental information describing waste categories

| | | | HWD | NHWD | RWD |
|---------------|--------------------------|------|----------|----------|----------|
| | | | kg | kg | kg |
| Product stage | Raw material supply | A1 | 1.21E-01 | 4.54E-01 | 4.66E-04 |
| | Transport | A2 | 2.53E-03 | 2.82E-01 | 4.17E-05 |
| | Manufacturing | A3 | 3.02E-03 | 2.35E-02 | 1.98E-05 |
| | Total (of product stage) | A1-3 | 1.26E-01 | 7.60E-01 | 5.27E-04 |

HWD = Hazardous waste disposed;
NHWD = Non-hazardous waste disposed;
RWD = Radioactive waste disposed

Other environmental information describing output flows – at end of life

| | | | CRU | MFR | MER | EE |
|---------------|--------------------------|------|----------|----------|----------|-----------------------|
| | | | kg | kg | kg | MJ per energy carrier |
| Product stage | Raw material supply | A1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Transport | A2 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| | Manufacturing | A3 | 0.00E+00 | 3.56E-02 | 0.00E+00 | 0.00E+00 |
| | Total (of product stage) | A1-3 | 0.00E+00 | 3.56E-02 | 0.00E+00 | 0.00E+00 |

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Interpretation

Analysis of the results shows that the following raw materials have the highest and second highest impacts for the selected indicators:

| Indicator | Highest impact | 2nd highest impact |
|-----------|-------------------------|-------------------------|
| GWP | Nylon 6 yarn (74.8%) | Bitumen backing (18.1%) |
| ODP | Bitumen backing (77.4%) | Nylon 6 yarn (12.2%) |
| AP | Nylon 6 yarn (70.4%) | Bitumen backing (21.1%) |
| EP | Nylon 6 yarn (62.1%) | Bitumen backing (25.9%) |
| POCP | Nylon 6 yarn (62.8%) | Bitumen backing (25.0%) |
| ADPE | Nylon 6 yarn (64.8%) | Bitumen backing (27.3%) |
| ADPF | Nylon 6 yarn (52.1%) | Bitumen backing (38.3%) |

References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013. London, BSI, 2013.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.

Life cycle inventory analysis (LCI) for textile floor coverings; Part II, LCA for carpet tiles; From cradle to factory gate, Deutsches Teppich-Forschungsinstitut (Textile Flooring Institute - TFI), Aachen, 2007.

Dutfield A, Mundy J and Anderson J; The Environmental Impact of Materials Series: Floor Finishes (incorporating the Green Guide ratings for floor finishes), Watford, 2011.

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