ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Gradus Ltd.
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-SHA-20230476-CBA2-EN
Issue date	18.12.2023
Valid to	17.12.2028

Gradus Carpet Tile with Nylon Face Fibre

Gradus Ltd.

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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GRADUS

General Information

Gradus Ltd.

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-SHA-20230476-CBA2-EN

This declaration is based on the product category rules:

Floor coverings, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

18.12.2023

Valid to

17.12.2028

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Gradus Carpet Tile with Nylon Face Fibre

Owner of the declaration

Gradus Ltd.
Chapel Mill, Park Green *
SK11 7LZ Mecclesfield, Cheshire
United Kingdom

Declared product / declared unit

1 m^2 of installed Gradus Bitumen Backed Carpet Tile

Scope:

A Life Cycle Assessment (LCA) was conducted based upon production data collected from Gradus, Ltd. manufacturing facility (Chapel Mill, Park Green, Macclesfield, Cheshire, SK11 7LZ), located in Scotland, UK. Production data was collected for Gradus Premium Loop Pile Tufted, Bitumen Backed Carpet Tile with Nylon Face Fibre, for the period of one year, from January to December 2021.

This EPD is cradle-to-gate with options in scope with additional modules A4, A5, B1 and B2. The EPD is created in accordance to the specifications of EN 15804+A2.

The functional unit has been defined as 1 m^2 of installed Gradus Premium Loop Pile Tufted, Bitumen Backed Carpet Tile.

The EPD was generated with the help of Envision LCA Tool, version 1. The tool has not been manipulated in calculating impact results. The current version of the tool is maintained, saved, and stored for 10 years to be used for revision and re-traceability purposes.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally

Mrs Kim Allbury,
(Independent verifier)

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Product

Product description/Product definition

This EPD applies to Gradus Premium Loop Pile Tufted, Bitumen Backed Carpet Tile with Nylon face fibre.

The carpet tile backing system contains a modified bitumen polymer, mineral filler, and a fibreglass reinforcement layer for dimensional stability. The face fibre is made of solution-dyed Nylon that is tufted into a primary backing sheet, then latex is added to anchor the fibre in place to assure maximum tuft bind. The bitumen-based backing system is then applied to create a durable flooring solution for use in varied applications. The carpet tiles are then die-cut and packaged for distribution.

This Gradus Premium Loop Pile Tufted, Bitumen Backed Carpet Tile is a commercial carpet tile, suitable for use in all commercial settings as a floor covering, in accordance with manufacturer guidelines. It has a life span of 12 years and comes with a 12-year wear warranty (subject only to installation and maintenance being carried out in line with manufacturer's guidelines). The product meets both internal and external performance standards including those established in the EU under EN 1307 and EN 10874 for a product suitable for heavy and general commercial installations.

This product is manufactured in the UK. Raw materials are responsibly sourced through supply chain, chemical and waste management programs. No co-products are produced in the manufacturing of these premium carpet tiles.

Detailed Product Descriptions:

Urban Myth is a textured loop pile carpet available in both tile and plank format. The random design offers versatility and the opportunity to create innovative and complimentary colours comprising six grey base tones and six vibrant accent colours that can be combined to create stunning installations.

Lunar is a tufted loop pile carpet tile. Inspired by the lunar landscape, the design is available in a choice of eight colourways to help create a stylish and modern environment. Lunar is suitable for use in a wide range of applications including commercial office and education spaces.

Cityscene & Brickworks are tufted loop pile carpet tiles that can be used together to create interesting and contemporary floor schemes. They can also be combined with *Emphasis* to create a unique design statement. They are suitable for a wide range of uses including commercial office, education, and healthcare. For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration EN 14041:2004A/C:2006, and the CE-marking.

For the application and use, the respective national provisions apply.

Application

Gradus Premium Loop Pile Tufted, Bitumen Backed Carpet Tile with Nylon Face Fibre is suitable for use as a floor covering in heavy and general commercial installations.

Technical Data

The technical specifications of the product are listed on the product's specification sheet, found at www.gradus.com. This product meets the requirements of the harmonized European Norm (hEN): EN14041:2004A/C:2006. Declarations of performance related to fire, electrostatic, formaldehyde emissions, and slip resistance can be found on the product's specification sheet.

Constructional data

Name	Value	Unit
Product thickness	5.8 - 6.2	mm
Grammage	3896.4	g/m^2
Product Form	Carpet Tile	-
Yarn type - Solution-dyed Nylon 6	0% Post-industrial Recycled Content	-
Total thickness	5.8 - 6.2	mm
Total carpet weight	3600 - 4170	g/m^2
Surface pile thickness	2.4 - 2.6	mm
Surface pile weight - Nominal Pile Mass	610 - 800	g/m^2
Length and width of squared elements	250 - 1000	mm

Other technical data parameters listed in IBU PCR Part B are not relevant and, therefore, have not been declared.

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to 14041:2004A/C:2006.

Base materials/Ancillary materials

Gradus Premium Loop Pile Tufted, Bitumen Backed Carpet Tile with Nylon Face Fibre is comprised of the following raw materials:

- 50-60% Calcium Carbonate Filler
- 12-18% Modified Bitumen Polymer
- 12-18% Solution-dyed Nylon 6 Face Fibre
- 8-13% Styrene Butadiene Co-Polymer Latex
- 1-4% Polyester Primary Backing
- 1-3% Polypropylene Secondary Backing
- 0.1-1% Fibreglass Reinforcement
- 0-0.1% Anti-stat

The product is packaged in cardboard boxes, wrapped in plastic, and stacked on wooden pallets for distribution.

The product fits into the defined scope and all raw material inputs, with no exceptions, are captured by the Envision LCA Tool, version 1.

This product contains substances listed in the candidate list (date: **17.01.2023**) exceeding 0.1 percentage by mass: **no**

This product contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: **no**

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012): **no**

Reference service life

When properly installed as a commercial floor covering, Gradus Premium Loop Pile Tufted, Bitumen Backed Carpet Tile with Nylon face fibre has a reference service life of 12 years. This carpet tile product comes with a 12-year warranty and 10-year antistatic warranty, subject only to installation and maintenance being carried out in accordance with the manufacturer's

guidelines.

LCA: Calculation rules

Declared Unit
The declaration refers to the declared unit of 1 m² of installed carpet tile.

Declared unit

Name	Value	Unit
Declared unit	1	m^2
Grammage	3.896	kg/m^2
Layer thickness	0.006	m

System boundary
The type of EPD is **Cradle-to-Gate** with options modules C1–C4, module D, and additional modules. The additional modules are A4, A5, B1 and B2.

The modules considered in the life cycle assessment and environmental product declaration, based on the product's entire life cycle, are described as follows:

Production Stage:

- Module A1 - Provision of Raw Materials.
- Module A2 - Transport of Raw Materials.
- Module A3 - Manufacturing.

Construction/Installation Stage:

- Module A4 - Transportation by truck of the product to the construction site in Europe.
- Module A5 - Installation of the carpet, treatment of cutting waste (landfill) and packaging waste (landfill, recycling, and incineration). The production of the amount of carpet that occurs as installation waste is also included along with its transport to the place of installation. Biogenic carbon that is stored in the wooden pallets and cardboard (packaging) is released as carbon dioxide emissions into the air at the end of life in module A5.

Use Stage:

- Module B1 - Indoor emissions of volatile organic compounds (VOCs) during the first few months after installation.
- Module B2 - Carpet cleaning per year, including vacuuming (electricity consumption) and hot water cleaning (electricity and water consumption, as well as waste water treatment).
- Module B3 - Repair (module not relevant).
- Module B4 - Replacement (module not relevant).
- Module B5 - Refurbishment (module not relevant).
- Module B6 - Operational Energy Use (module not relevant).
- Module B7 - Operational Water Use (module not relevant).

End of Life Stage:
Three scenarios have been evaluated:
Scenario 1: the Gradus Bitumen Backed carpet is 100% disposed of in a landfill.
Scenario 2: the Gradus Bitumen Backed carpet is 100% incinerated.
Scenario 3: 40% of Gradus Bitumen Backed carpets are incinerated and the remaining 60% are landfilled. This assumption is based on the carpet disposal rates in Europe mentioned in the study conducted by Deutsche Umwelthilfe in 2017 (Umwelthilfe, 2017) and the European Commission in 2013 (Commission, 2013).

- Module C1 - The carpet is de-constructed manually and no additional environmental impact is caused.
- Module C2 - Transport of the carpet waste to a landfill or to the municipal waste incineration plant.
- Module C3 - Impacts from thermal treatment disposal (C3/2 and C3/3).
- Module C4 - Impacts from landfill disposal (C4/1 and C4/3).

Module D includes benefits from energy recovery via treatment of packaging materials and incineration of carpets at their end of life (D/1, D/2 and D/3), as well as the burdens of balancing the secondary material content in modules A1 and A3 via the net-scrap approach.

Geographic Representativeness
Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Europe

Comparability
Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. The background database used for the creation of the EPD: *GaBi ts software,* CUP 2022.2.

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon
Biogenic carbon is only present in packaging (wooden pallets and cardboards). Assumed water content in wooden pallet (packaging): 18%.

Information on describing the Biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in accompanying packaging	0.14	kg C

The following technical scenario information is required for the declared modules and optional for non-declared modules.

Transport to the construction site (A4)

Name	Value	Unit
Transport distance (truck)	687	km
Capacity utilisation (including empty runs)	55	%

Installation in the building (A5)
The installation of Gradus Bitumen Backed Carpet Tile is done manually and no energy is required. A Pressure-Sensitive adhesive is required for the installation of Gradus Bitumen Backed Carpet Tile and should be used in accordance with the manufacturer's guidelines. Installation losses have been accounted for in module A5. Product losses are considered as 5%.

The packaging material treatment and disposal are also considered in module A5 (landfill, recycling, and incineration)

and the resulting benefits from energy generation are included in module D. The quantity of wooden pallets used is 0.133 kg per m². Wooden pallets are assumed to be re-used 20 times before being disposed of. Hence, the quantity of pallet disposed is 0.007 kg. The quantity of cardboard packaging is 0.21 kg/m² and the quantity of plastic packaging is 0.0103 kg/m². Total amount of packaging disposed at installation is 0.227 kg. Packaging disposal rates (Source: Eurostat, Recovery and recycling rates for packaging).

- Paper - 82.8% recycled; 9.4% landfilled; and 7.8% incinerated
- Plastic - 40.3% recycled; 28.7% landfilled; and 31.0% incinerated
- Wood pallets - 39.8% recycled; 34.5% landfilled; and 25.7% incinerated

Name	Value	Unit
Auxiliary	0.23	kg
Material loss	0.203	kg
Output substances following waste treatment on site (packaging materials)	0.227	kg

Maintenance (B2)

For the maintenance of Gradus Bitumen Backed Carpet Tile, 2 hot water extraction cleanings (water and electricity consumption) per year as well as 52 vacuum cleanings (electricity consumption) per year are recommended. The Reference Service Life of the product is 12 years. The results in the EPD declare a maintenance for the period of 1 year.

Name	Value	Unit
Water consumption (1 year)	0.0009	m^3
Electricity consumption (1 year)	0.772	kWh

Reference service life

Name	Value	Unit
Reference service life (according to ISO 15686-1, -2, -7 and -8)	12	a
Life Span according to the manufacturer	12	a

End of Life (C1-C4)

C1 - The product dismantling from the building is done manually without energy burden.
C2 - Transportation of the product to the end of life is assumed to be 161 km (100 miles).
C3/2 - The Gradus Bitumen Backed carpet is 100% combusted in an incineration plant with energy recovery (R>0.6).
C3/3 - It is assumed that 40% of Gradus Bitumen Backed carpets are incinerated and the remaining 60% are landfilled.
C4/1 - The Gradus Bitumen Backed carpet is 100% disposed of in landfill.
C4/3 - It is assumed that 40% of Gradus Bitumen Backed carpets are incinerated and the remaining 60% are landfilled.

Name	Value	Unit
Collected as mixed construction waste	3.896	kg
Landfilling (Scenario 1 - C3/1, C4/1 and D/1)	3.896	kg
Incineration (Scenario 2 - C3/2, C4/2, and D/2)	3.896	kg
Landfilling (60%) and Incineration (40%) (Scenario 3 - C3/3, C4/3 and D/3)	3.896	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

For the thermal and electrical energy generated in Module A5 due to thermal treatment of packaging, avoided burdens have been calculated by the inversion of electricity grid mix and thermal energy from natural gas, using European datasets. Module D also includes the environmental burdens linked to the supply to secondary materials (nylon and calcium carbonate) used in the carpet production.

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LCA: Results

The B2 module declares the maintenance (cleaning) per one year. The user of the EPD will be able to scale the results for its entire useful life by multiplying the impact by the RSL.

The LCA results presented below applies to 100% landfilled end of life scenario.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² Gradus Bitumen Backed Carpet

Parameter	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	7.58E+00	2.45E-01	5.05E-01	2.54E-04	2.32E-01	0	5.28E-02	0	2.73E-01	-1.72E-02
GWP-fossil	kg CO_2 eq	7.9E+00	2.44E-01	5.08E-01	2.54E-04	2.29E-01	0	5.26E-02	0	2.76E-01	-2.11E-02
GWP-biogenic	kg CO_2 eq	-3.28E-01	-3.37E-04	-3.64E-03	0	2.44E-03	0	-7.26E-05	0	-2.94E-03	3.88E-03
GWP-luluc	kg CO_2 eq	3.38E-03	1.36E-03	2.87E-04	0	4.85E-05	0	2.93E-04	0	1.34E-04	-3.19E-06
ODP	kg CFC11 eq	8.28E-09	1.46E-14	4.36E-10	0	3.35E-12	0	3.15E-15	0	3.71E-13	-1.22E-13
AP	mol H^+ eq	1.43E-02	2.51E-04	1.17E-03	0	5.03E-04	0	5.42E-05	0	8.18E-04	-3.47E-05
EP-freshwater	kg P eq	2.07E-05	7.28E-07	1.57E-05	0	1.12E-06	0	1.57E-07	0	5.15E-05	-3.08E-08
EP-marine	kg N eq	3.63E-03	8.22E-05	2.66E-04	0	1.15E-04	0	1.77E-05	0	1.81E-04	-9.64E-06
EP-terrestrial	mol N eq	3.46E-02	9.79E-04	3.27E-03	0	1.18E-03	0	2.11E-04	0	1.99E-03	-1.03E-04
POCP	kg NMVOC eq	1.22E-02	2.21E-04	9.72E-04	1.41E-05	3.05E-04	0	4.77E-05	0	5.83E-04	-3.14E-05
ADPE	kg Sb eq	1.04E-06	2.04E-08	7.99E-08	0	6.24E-08	0	4.4E-09	0	1.92E-08	-3.33E-09
ADPF	MJ	1.73E+02	3.26E+00	1.05E+01	0	4.15E+00	0	7.03E-01	0	3.92E+00	-5.01E-01
WDP	m^3 world eq deprived	3.57E-01	2.19E-03	8.86E-02	0	5.23E-02	0	4.72E-04	0	-2.72E-03	-2.98E-03

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m² Gradus Bitumen Backed Carpet

Parameter	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4	D
PERE	MJ	1.21E+01	1.95E-01	5.11E+00	0	2.31E+00	0	3.99E-02	0	3.22E-01	-1.29E-01
PERM	MJ	5.31E+00	0	-4.19E+00	0	0	0	0	0	0	0
PERT	MJ	1.74E+01	1.95E-01	9.21E-01	0	2.31E+00	0	3.99E-02	0	3.22E-01	-1.29E-01
PENRE	MJ	1.31E+02	3.44E+00	1.57E+00	0	4.15E+00	0	7.04E-01	0	3.92E+00	-5.02E-01
PENRM	MJ	5.1E+01	0	-3.17E-01	0	0	0	0	0	0	0
PENRT	MJ	1.81E+02	3.44E+00	1.26E+00	0	4.15E+00	0	7.04E-01	0	3.92E+00	-5.02E-01
SM	kg	1.1E-01	0	5.77E-03	0	0	0	0	0	0	-1.15E-01
RSF	MJ	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0
FW	m^3	2.36E-02	2.1E-04	9.32E-03	0	2.2E-03	0	4.52E-05	0	5.07E-05	-1.05E-04

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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m² Gradus Bitumen Backed Carpet

Parameter	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4	D
HWD	kg	3.92E-07	1.56E-11	2.31E-08	0	3.59E-10	0	3.37E-12	0	6.04E-10	-4.49E-11
NHWD	kg	2.94E-01	4.68E-04	2.48E-01	0	3.82E-03	0	1.01E-04	0	3.88E+00	-2.01E-04
RWD	kg	3.52E-03	4.02E-06	2.05E-04	0	6.64E-04	0	8.67E-07	0	4.81E-05	-2.33E-05

CRU	kg	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	1.81E-01	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	6.37E-02	0	0	0	0	0	0	0
EET	MJ	0	0	9.77E-02	0	0	0	0	0	0	0

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:
1 m² Gradus Bitumen Backed Carpet

Parameter	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3	C4	D
PM	Disease incidence	1.36E-07	1.45E-09	1.2E-08	0	4.17E-09	0	3.13E-10	0	7.87E-09	-7.87E-10
IR	kBq U235 eq	3.76E-01	5.9E-04	2.24E-02	0	1.12E-01	0	1.27E-04	0	7.11E-03	-3.92E-03
ETP-fw	CTUe	9.28E+01	2.26E+00	5.93E+00	1.15E-04	1.88E+00	0	4.88E-01	0	3.83E+00	-1.94E-01
HTP-c	CTUh	2.64E-09	4.56E-11	1.76E-10	0	5.43E-11	0	9.83E-12	0	1.72E-10	-5.75E-12
HTP-nc	CTUh	1.34E-07	2.37E-09	9.28E-09	3.07E-12	2.12E-09	0	5.1E-10	0	1.44E-08	-2.24E-10
SQP	SQP	1.4E+01	1.12E+00	1.12E+01	0	1.5E+00	0	2.42E-01	0	2.82E-01	-6.47E-01

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1: For the indicator 'Potential Human exposure efficiency relative to U235". This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2: For the indicators 'Abiotic depletion potential for non-fossil resources', 'Abiotic depletion potential for fossil resources", "Water (user) deprivation potential", "Deprivation-weighted water consumption", "Potential comparative toxic unit for ecosystems", "Potential comparative toxic unit for humans -cancerogenic", "Potential comparative toxic unit for humans -non-carcinogenic", "Potential soil quality index". The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicators. This EPD was created using a software tool.

References

STANDARDS:

EN 10874
EN 10874:2009, Resilient, textile and laminate floor coverings — Classification.

EN 1307
EN 1307:2014, Textile floor coverings — Classification.

EN 14041
EN 14041:2004/AC:2006 — Resilient, textile and laminate floor coverings — Essential characteristics.

EN 15804
EN 15804:2012+A2:2019/AC:2021, Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction products.

ISO 14025
ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

ISO 14040
ISO 14040:2006, Environmental management — Life cycle assessment — Principles and framework.

ISO 14044
ISO 14044:2006, Environmental management — Life cycle assessment — Requirements and guidelines.

ISO 15686
ISO 15686-1:2011, Building and constructed assets — Service life planning — Part 1: General principles and framework.

ISO 15686
ISO 15686-2:2011, Building and constructed assets — Service life planning — Part 2: Service life prediction procedures.

ISO 15686
ISO 15686-7:2011, Building and constructed assets — Service life planning — Part 7: Performance evaluation for feedback of service life data from practice.

ISO 15686
ISO 15686-8:2011, Building and constructed assets — Service life planning — Part 8: Reference service life and service life estimation.

FURTHER REFERENCES:

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Candidate List of substances of very high concern for Authorisation, published on ECHA website, latest version 17.01.2023 (https://echa.europa.eu/candidatelist-table).

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Deutsche Umwelthilfe. Swept under the Carpet: The Big Waste Problem of the Carpet Industry in Germany, 2017.

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Envision LCA Tool, 2021, Sphera Solutions GmbH, Leinfelden-Echterdingen, with acknowledgement of LBP University of Stuttgart, version 1.

GaBi
GaBi Software System and Database for Life Cycle Engineering, 1992-2021, Sphera Solutions GmbH, Leinfelden-Echterdingen, with acknowledgement of LBP University of Stuttgart, program version GaBi 10; database version 2021.1.

GaBi documentation

GaBi dataset documentation for the software system and databases, LBP, University of Stuttgart and Sphera Solutions GmbH, Leinfelden-Echterdingen, 2021 (http://www.gabi-software.com/support/gabi/gabi-database-2021-lci-documentation/).

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Institut Bauen und Umwelt e.V.: General Instructions for the EPD programme of Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021 (www.ibu-epd.com).

PCR Part A
PCR Part A: Calculation rules for the Life Cycle Assessment and Requirements on the Background Report according to EN 15804:2012+A2:2019/AC:2021, Version 1.3, Institut Bauen und Umwelt e.V., 2021.

PCR Part B
Product Category Rules for Building Products, Part B: Requirements on the EPD for floor coverings, version 1.7, 2022 (www.bau-umwelt.de).

Packaging disposal rates
Eurostat, Recovery and recycling rates for packaging. 2015 (http://ec.europa.eu/eurostat/web/environment/waste/main-tables).
The literature referred to in the Environmental Product Declaration must be listed in full.Standards already fully quoted in the EPD do not need to be listed here again.
The current version of PCR Part A and PCR Part B of the PCR document on which they are based must be referenced.

GRADUS

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Annex
For Gradus Carpet Tile with Nylon Face Fibre
Gradus Ltd.

to the

ENVIRONMENTAL PRODUCT DECLARATION
as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Gradus Ltd.
Declaration number	EPD-SHA-20230476-CBA1-EN
Issue date	18/12/2023
Valid to	17/12/2028

Institut Bauen und Umwelt e.V.

www.ibu-epd.com / https://epd-online.com

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General Information

Gradus Ltd.

Gradus Carpet Tile with Nylon Face Fibre

Programme holder
IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Owner of the declaration
Gradus Ltd.
Chapel Mill, Park Green
Macclesfield, Cheshire
SK11 7LZ
United Kingdom

Declaration number
EPD-SHA-20230476-CBA1-EN

Declared product / declared unit
1 m^2 of installed Gradus Bitumen Backed Carpet Tile

This declaration is based on the product category rules:
Floor coverings, 01/08/2021
(PCR checked and approved by the SVR)

Scope:
A Life Cycle Assessment (LCA) was conducted based upon production data collected from Gradus Ltd. manufacturing facility (Chapel Mill, Park Green, Macclesfield, Cheshire, SK11 7LZ), located in Scotland, UK. Production data was collected for Gradus Premium Loop Pile Tufted, Bitumen Backed Carpet Tile with Nylon Face Fibre, for the period of one year, from January to December 2021.

The associated EPD is cradle-to-gate with options in scope with additional modules A4, A5, B1, and B2. The associated EPD is created in accordance to the specifications of *EN 15804+A2.*

This Annex contains the Global Warming Potential results [kg CO_2-eq.] for additional product face fibre weights, calculated based on 100% landfill end-of-life scenario.

The functional unit has been defined as 1 m^2 of installed Gradus Premium Loop Pile Tufted, Bitumen Backed Carpet Tile.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of *EN 15804+A2*. In the following, the standard will be simplified as *EN 15804*.

Issue date
18/12/2023

Valid to
17/12/2028

Verification

The standard *EN 15804* serves as the core PCR
Independent verification of the declaration and data according to *ISO 14025:2011*
☐ internally ☒ externally

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Kim Allbury
(Independent verifier)

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LCA: Calculation rules

This Annex contains the Global Warming Potential results [kg CO_2-eq.] for additional product face fibre weights, calculated based on 100% landfill end-of-life scenario.

LCA: GWP-total [kg CO_2-eq.] Results for Additional Face Fibre

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	X	X	X	X	MNR	MNR	MNR	ND	ND	X	X	X	X	X

Face Fibre	Unit	A1-A3	A4	A5	B1	B2	C2	C3	C4	D
400 g/m²	[kg CO_2 eq.]	5.84E+00	2.33E-01	5.05E-01	2.54E-04	2.32E-01	5.02E-02	0.00E+00	2.60E-01	-1.64E-02
450 g/m²	[kg CO_2 eq.]	6.23E+00	2.35E-01	5.05E-01	2.54E-04	2.32E-01	5.07E-02	0.00E+00	2.63E-01	-1.66E-02
500 g/m²	[kg CO_2 eq.]	6.68E+00	2.39E-01	5.05E-01	2.54E-04	2.32E-01	5.14E-02	0.00E+00	2.66E-01	-1.68E-02
550 g/m²	[kg CO_2 eq.]	7.13E+00	2.42E-01	5.05E-01	2.54E-04	2.32E-01	5.21E-02	0.00E+00	2.70E-01	-1.70E-02
580 g/m²	[kg CO_2 eq.]	7.36E+00	2.43E-01	5.05E-01	2.54E-04	2.32E-01	5.25E-02	0.00E+00	2.72E-01	-1.71E-02
600 g/m²	[kg CO_2 eq.]	7.58E+00	2.45E-01	5.05E-01	2.54E-04	2.32E-01	5.28E-02	0.00E+00	2.73E-01	-1.72E-02
650 g/m²	[kg CO_2 eq.]	8.03E+00	2.48E-01	5.05E-01	2.54E-04	2.32E-01	5.35E-02	0.00E+00	2.77E-01	-1.75E-02
680 g/m²	[kg CO_2 eq.]	8.32E+00	2.50E-01	5.05E-01	2.54E-04	2.32E-01	5.39E-02	0.00E+00	2.79E-01	-1.76E-02
700 g/m²	[kg CO_2 eq.]	8.48E+00	2.51E-01	5.05E-01	2.54E-04	2.32E-01	5.41E-02	0.00E+00	2.80E-01	-1.77E-02
750 g/m²	[kg CO_2 eq.]	8.89E+00	2.54E-01	5.05E-01	2.54E-04	2.32E-01	5.48E-02	0.00E+00	2.84E-01	-1.79E-02
750 g/m²	[kg CO_2 eq.]	8.93E+00	2.54E-01	5.05E-01	2.54E-04	2.32E-01	5.48E-02	0.00E+00	2.84E-01	-1.79E-02
800 g/m²	[kg CO_2 eq.]	9.38E+00	2.57E-01	5.05E-01	2.54E-04	2.32E-01	5.55E-02	0.00E+00	2.87E-01	-1.81E-02
810 g/m²	[kg CO_2 eq.]	9.51E+00	2.58E-01	5.05E-01	2.54E-04	2.32E-01	5.57E-02	0.00E+00	2.88E-01	-1.82E-02
850 g/m²	[kg CO_2 eq.]	9.83E+00	2.61E-01	5.05E-01	2.54E-04	2.32E-01	5.62E-02	0.00E+00	2.91E-01	-1.83E-02
880 g/m²	[kg CO_2 eq.]	1.01E+01	2.62E-01	5.05E-01	2.54E-04	2.32E-01	5.66E-02	0.00E+00	2.93E-01	-1.85E-02
900 g/m²	[kg CO_2 eq.]	1.03E+01	2.64E-01	5.05E-01	2.54E-04	2.32E-01	5.68E-02	0.00E+00	2.94E-01	-1.86E-02
950 g/m²	[kg CO_2 eq.]	1.07E+01	2.67E-01	5.05E-01	2.54E-04	2.32E-01	5.75E-02	0.00E+00	2.98E-01	-1.88E-02
950 g/m²	[kg CO_2 eq.]	1.07E+01	2.67E-01	5.05E-01	2.54E-04	2.32E-01	5.75E-02	0.00E+00	2.98E-01	-1.88E-02
1000 g/m²	[kg CO_2 eq.]	1.12E+01	2.70E-01	5.05E-01	2.54E-04	2.32E-01	5.82E-02	0.00E+00	3.01E-01	-1.90E-02

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