ENVIRONMENTAL PRODUCT DECLARATION

CQUEST™BIOX

MODULAR CARPET TILE

CQUEST™BioX
Our backing that stores the most carbon. It's the same material make-up as CQuest™Bio with a higher concentration of carbon negative materials.

Interface®

For more than four decades, Interface has consistently led the industry through design and innovation and is a world leader in environmental sustainability. We are committed to transparency and will continue to share our progress as we work to become a carbon negative company by 2040.

At Interface, we believe Life Cycle Assessment is critical for evaluating the environmental impacts of our products. The LCA-based Environmental Product Declaration is the best way to provide full disclosure of those impacts to our customers.

Interface was one of the first companies to develop EPDs for all of our products manufactured globally, and we are committed to providing this level of transparency to our customers, partners and the industry.

For more information visit www.interface.com.

UL CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

ENVIRONMENTAL PRODUCT DECLARATION

Interface®

CQUEST™BioX

According to ISO 14025,
EN 15804, and ISO21930:2017

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL Environment 333 Pfingsten Road Northbrook, IL 60611 https://www.ul.com/ https://spot.ul.com
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	General Program Instructions v.2.5 March 2020
MANUFACTURER NAME AND ADDRESS	Interface, Inc.; Troup County, Georgia, USA & Scherpenzeel, NL
DECLARATION NUMBER	4788873607.102.1
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	CQUEST BioX Modular Flooring Tile; Functional Unit of 1 square meter of floor covering
REFERENCE PCR AND VERSION NUMBER	Part A: Life Cycle Assessment Calculation Rules and Report Requirements, (UL Environment, V3.2, 2018) and Part B: Flooring EPD Requirements (UL Environment V2.0, 2018)
DESCRIPTION OF PRODUCT APPLICATION/USE	Interface's CQuest TM BioX is a non-vinyl bio-composite backing made with bio-resins, bio-fillers, and bio-oils manufactured in Troup County, Georgia, USA and in Scherpenzeel, NL
DATE OF ISSUE	July 1, 2020
DATE OF EXPIRATION	June 30, 2026
EPD TYPE	Product-Specific
EPD SCOPE/ REGION	Cradle-to-grave/ North America and Europe
LCA SOFTWARE & VERSION NUMBER	Gabi v. 9.2.169
LCI DATABASE(S) & VERSION NUMBER	Gabi v. 9.2.169
LCIA METHODOLOGY & VERSION NUMBER	TRACI 2.1

This PCR review was conducted by:	UL Environment PCR Review Panel epd@ulenvironment.com
This declaration was independently verified in accordance with ISO 14025: 2006. ☐ INTERNAL ☒ EXTERNAL	Grant R. Martin Grant R. Martin, UL Environment
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria Thomas P. Gloria, Industrial Ecology Consultants

LIMITATIONS

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; the level of accuracy in estimation of effect differs for any particular product line and reported impact.

Comparability: EPDs from different programs may not be comparable. Full conformance with a PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.

1. Product Definition and Information

1.1. Description of Company/Organization

Interface, Inc. is a global flooring company specializing in carbon neutral carpet tile and resilient flooring, including luxury vinyl tile (LVT) and nora® rubber flooring. We help our customers create high-performance interior spaces that support well-being, productivity, and creativity, as well as the sustainability of the planet. Our mission, Climate Take Back™, invites you to join us as we commit to operating in a way that is restorative to the planet and creates a climate fit for life.

1.2. Product Description

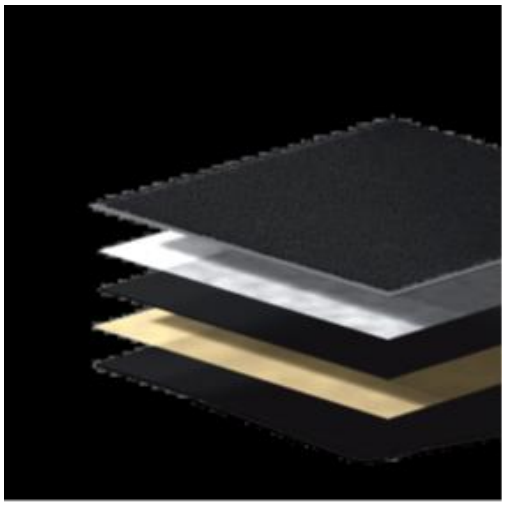


Figure 1 (left) : CQuest™ carbon negative backings, layered with: Yarn tufted into the primary backing; a pre-coat; backing compound; stabilizing glass tissue and an additional layer dependent on manufacture location.

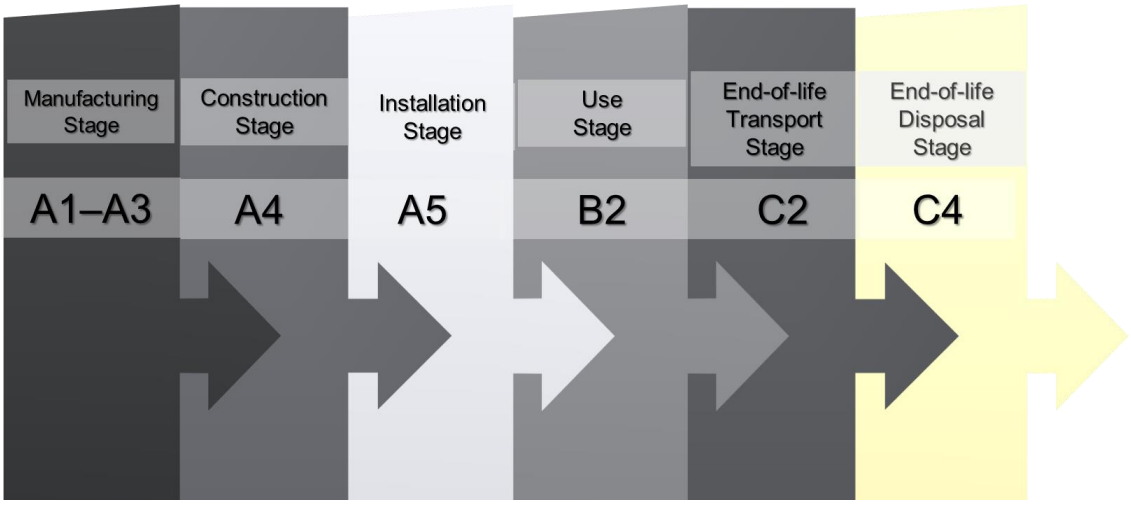
Product Identification

Interface's CQuest ™BioX is a non-vinyl bio-composite backing made with bio-resins, bio-fillers, and bio-oils manufactured in Troup County, Georgia, USA and in Scherpenzeel, NL. This Environmental Product Declaration covers all styles and patterns of modular carpet on CQuest™BioX backing with 407 grams of recycled Nylon yarn with a negative cradle-to-gate carbon footprint.

Product Specification

UNSPSC code: 301617
CSI code: 09680

Flow Diagram



1.3. Application

Application of product is intended for modular installation of floorcovering in commercial buildings.

1.4. Declaration of Methodological Framework

The data is retrieved from a cradle to grave LCA study. The description of study boundaries is declared in Table 11.

1.5. Technical Requirements

Technical Data

Name	Value	Unit
Yarn type	Nylon	
Primary backing type	Polyester	
Secondary backing type	CQuest™BioX (biobased resin)	
CRI rating	3	2.5 Moderate, 3.0 Heavy, 3.5 Severe
Total thickness	Variable	mm
Product weight*	2800	g/m^2
Surface pile thickness*	1.5	mm
Surface pile weight	407	g/m^2

** nominal values*

1.6. Market Placement / Application Rules

Product considered relevant technical specifications such as ASTM E-648 and ASTM E-662. See Section 6.3 for more info.

1.7. Material Composition

Component	Material	% Mass *
Yarn	Nylon	13%
	Post-consumer recycled nylon	7%
	Pre-consumer recycled nylon	2%
Primary backing	Pre- & post-consumer recycled polyester	3%
Precoat backing	Vinyl acetate emulsion	5%
	Pre-consumer recycled limestone	3%
	Alumina trihydrate	3%
Stabilization layer	Fiberglass mat	1%
Secondary backing	Bio-based filler	28%
	Bioester	16%
	Ethylene vinyl acetate	11%
	Biobased oil	2%
	Pre-consumer recycled limestone	4%
	Antioxidant	1%
	Polypropylene	1%

** nominal values*

1.8. Manufacturing

CQuest™BioX is manufactured in Troup county, Georgia and in Scherpenzeel, Netherlands.

1.9. Packaging

Planks and tiles are packaged in cardboard boxes. Packaging waste should be reused or sent local cardboard recycling facilities.

1.10. Transportation

Delivery is represented as transport by truck over a distance of 500 miles (805 km).

1.11. Product Installation

Product may be installed with pressure sensitive adhesive. For full installation instructions, see the Interface Installation Guide.

1.12. Use

Conditions of use: During the reference service life of the carpet, it should be cleaned in accordance with the product warranty instructions including vacuuming and extraction cleaning. The frequency is dependent upon the expected foot traffic and local conditions.

1.13. Reference Service Life and Estimated Building Service Life

Reference service life is indicated in Table 3.

1.14. Reuse, Recycling, and Energy Recovery

The modular aspect of the product allows for easy reuse of the product. The product is intended to be recycled through Interface's ReEntry process.

1.15. Disposal

At end of life the product should be returned to Interface through Interface's ReEntry process by contacting Interface at 1 888-733-6873. Disposal in municipal landfill or commercial incineration facilities is permissible in accordance with local regulations.

2. Life Cycle Assessment Background Information

2.1. Functional or Declared Unit

The functional unit is one square meter of floorcovering.

Modular carpet on CQuest™BioX	Value	Unit
Functional unit	1	m^2
Mass*	2.8	kg

**nominal value*

2.2. System Boundary

The LCA is for one square meter of flooring. While the warranted service life is 15 years, modules B1, B3 ,B4, and B5 are not declared, so the maintenance (B4) is represented for one year. The system boundaries include:

A1 Raw material extraction and processing, and processing of recycled materials
A2 Transport to the factory
A3 Manufacturing including materials, packaging, energy, and waste disposal or recycling
A4 Transport to installation sites (Asia, US, and Europe)
A5 Installation including ancillary materials required for installation and trim-waste disposal
B2 Maintenance: Includes the energy for vacuuming, extraction cleaning and the production and transport of cleaning agents. The treatment of the waste-water from extraction cleaning is included. This is for one year of use.
C2 Transport of waste to local disposal
C4 Disposal

2.3. Estimates and Assumptions

The datasets for materials upstream from manufacturing are a combination of information from the GaBi database and supplier provided datasets. Inventories for all materials are not available and when unavailable, conservative proxy datasets were chosen based on similarity of material.

2.4. Cut-off Criteria

As dictated by the Part A: Calculation rules for the life cycle assessment and requirements, the cut-off criteria is less than 1% for energy use and less than 1% of total mass per unit process, the sum of which shall not exceed 5% of either energy or mass. If a flow met the cut-off criteria for exclusion, yet was thought to have significant environmental impact, then it was included.

2.5. Data Sources and Quality

The datasets for materials upstream from manufacturing are a combination of information from the GaBi database version 9.2.68 in 2020 and supplier provided datasets. The data quality ranges from good to very good. The temporal quality of the data is very good with both the manufacturing specific data and the GaBi background data being from 2020.

2.6. Period under Review

The data collection and the product described are an average product manufactured in 2020.

2.7. Allocation

Where relevant, the background data incorporates some allocation such as in the power mix. There are no co-products produced in the process, so the LCA model does not include allocation. No credits were taken for recycling of

production waste.

3. Life Cycle Assessment Scenarios

Table 1. Transport to the building site (A4)

Name	Value	Unit
Fuel type	Diesel	
Liters of fuel	0.00134	kg/100km
Vehicle type	Truck 34-40	tonnes
Transport distance	805	km
Capacity utilization (including empty runs, mass based)	85	%
Weight of products transported*	2.8	kg
Volume of products transported*	0.001	m^3
Capacity utilization volume factor	1	
*nominal values		

Table 2. Installation into the building (A5)

Name	Value	Unit
Ancillary materials	0.107	kg
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	-	m^3
Other resources	-	kg
Electricity consumption	-	kWh
Other energy carriers	-	MJ
Product loss per functional unit	0.06	kg
Waste materials at the construction site before waste processing, generated by product installation	0.16	kg
Output materials resulting from on-site waste processing (specified by route; e.g. for recycling, energy recovery and/or disposal)	-	kg
Mass of packaging waste specified by type	-	kg
Biogenic carbon contained in packaging	0.1	kg CO_2
Direct emissions to ambient air, soil and water	-	kg
VOC content	-	µg/m^3

Table 3. Reference Service Life

NAME	VALUE	UNIT
RSL	**15**	years

Table 4. Maintenance (B2)

Name	Value	Unit
Maintenance cycle	15	1/ RSL
Maintenance cycle	1	1/ ESL
Vacuum cleaning	365	1/year
Vacuum cleaning per RSL	5460	1/RSL
Extraction cleaning	2	1/year
Extraction cleaning per RSL	30	1/RSL
Net freshwater consumption specified by water source and fate (disposed to sewer)	1.93	kg/year
Ancillary materials (cleaning agent)	0.007	kg/year
Other resources	0.004	kg
Energy input, specified by activity, type and amount	1.6	MJ/year
Other energy carriers specified by type	-	kWh
Power output of equipment	-	kW
Waste materials from maintenance	-	kg
Direct emissions to ambient air, soil and water (waste water)	-	kg/year

Table 5. End of life (C2, C4)

NAME		VALUE	UNIT
Transport to site		32.0	km
Collection process (specified by type)	Collected separately	-	kg
	Collected with mixed construction waste	-	kg
Recovery (specified by type)	Reuse		kg
	Recycling		kg
	Landfill	3.00	kg
	Incineration	0.131	kg
	Incineration with energy recovery	-	kg
	Energy conversion efficiency rate	-	-
Disposal (specified by type)	Product or material for final deposition	-	kg
Removals of biogenic carbon (excluding packaging)		-	kg CO_2

4. Life Cycle Assessment Results

Table 6. Description of the system boundary modules

	PRODUCT STAGE			CONSTRUCT-ION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Building Operational Energy Use During Product Use	Building Operational Water Use During Product Use	Deconstruction	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling Potential
EPD Type	X			X	X	MND	MND	MND	MND	MND	X	MND	X	MND	X	X	X

4.1. Life Cycle Impact Assessment Results

Table 7. North American Impact Assessment Results

TRACI v2.1	A1-A3	A4	A5	B2	C2	C4
GWP [kg CO2 eq]	-3.69E-01	1.23E-01	1.10E-01	3.91E-01	4.89E-03	3.17E-01
ODP [kg CFC-11 eq]	3.83E-07	3.07E-17	7.01E-09	1.25E-09	1.22E-18	-2.10E-08
AP [kg SO_2 eq]	2.52E-02	6.74E-04	7.27E-04	8.17E-04	2.68E-05	-5.38E-04
EP [kg N eq]	5.70E-03	5.02E-05	1.34E-04	2.78E-04	2.00E-06	2.54E-04
SFP [kg O_3 eq]	4.04E-01	1.50E-02	1.08E-02	1.35E-02	5.97E-04	1.83E-03
ADP_{fossil} [MJ, LHV]	1.20E+01	2.39E-01	6.59E-01	3.05E-01	9.54E-03	2.38E-01

Caption	GWP 100 = global warming potential; ODP = ozone depletion potential; AP = acidification potential; EP = eutrophication potential; SFP = smog formation potential; ADP fossil= abiotic resource depletion potential of non-renewable (fossil) enery resources

Table 8. EU Impact Assessment Results

CML v4.2	A1-A3	A4	A5	B2	C2	C4
GWP 100 [kg CO2 eq]	-2.56E-01	1.23E-01	1.13E-01	3.92E-01	4.90E-03	3.18E-01
ODP [kg CFC-11 eq]	2.94E-07	3.07E-17	5.28E-09	1.15E-09	1.22E-18	-1.93E-08
AP [kg SO_2 eq]	2.29E-02	4.99E-04	6.85E-04	7.43E-04	1.99E-05	-6.67E-04
EP [kg PO_4^{-3} eq]	6.99E-03	1.25E-04	1.74E-04	1.86E-04	4.98E-06	5.51E-04
POCP [kg ethene eq]	9.50E-03	-2.05E-04	2.24E-04	5.72E-05	-8.15E-06	1.06E-07
$ADP_{element}$ [kg Sb-eq]	3.32E-06	1.15E-08	1.70E-07	2.20E-07	4.59E-10	-1.11E-07
ADP_{fossil} [MJ, LHV]	9.28E+01	1.67E+00	4.80E+00	3.49E+00	6.67E-02	9.18E-01

Caption	GWP 100 = global warming potential; ODP = depletion potential of the stratospheric ozone layer; AP = acidification potential of soil and water; EP = eutrophication potential; POCP = photochemical oxidant creation potential; ADP - elements = Abiotic depletion potential for non-fossil resources; ADP- fossil fuels = abiotic depletion potential for fossil resources

4.2. Life Cycle Inventory Results

Table 9. Resource Use

Parameter	A1-A3	A4	A5	B2	C2	C4
RPR_E [MJ, LHV]	2.55E+01	9.69E-02	–	9.65E-01	3.86E-03	-5.40E-02
RPR_M [MJ, LHV]	8.75E+01	–	2.31E+00	1.40E-02	–	–
$NRPR_E$ [MJ, LHV]	8.90E-01	1.68E+00	–	3.86E+00	6.70E-02	2.55E-01
$NRPR_M$ [MJ, LHV]	1.01E+02	–	5.06E+00	7.80E-01	–	–
SM [kg]	1.48E-01	0.00E+00	2.96E-03	0.00E+00	0.00E+00	0.00E+00
RSF [MJ, LHV]	2.00E-23	–	4.00E-25	–	–	–
NRSF [MJ, LHV]	2.35E-22	–	4.70E-24	–	–	–
RE [MJ, LHV]	–	–	–	–	–	–
FW [m^3]	6.24E-01	1.22E-04	1.31E-02	2.25E-03	4.87E-06	5.57E-04

Caption	RPRE = Renewable primary resources used as energy carrier (fuel); RPRM=Renewable primary resources with energy content used as material; NRPRE= Non-renewable primary resources used as an energy carrier (fuel); NRPRM= Non-renewable primary resources with energy content used as material; SM= Secondary materials; RSF=Renewable secondary fuels; NRSF: Non-renewable secondary fuels; RE= Recovered energy; FW=Use of net fresh water resources

Table 10. Output Flows and Waste Categories

Parameter	A1-A3	A4	A5	B2	C2	C4
HWD [kg]	2.08E-04	8.43E-08	6.43E-05	1.61E-05	3.36E-09	1.27E-08
NHWD [kg]	5.04E-01	2.89E-04	1.07E-01	2.38E-03	1.15E-05	3.34E+00
HLRW [kg]	2.87E-06	2.88E-09	9.70E-08	4.48E-07	1.15E-10	-3.66E-07
ILLRW [kg]	2.05E-03	3.10E-06	7.15E-05	4.34E-04	1.23E-07	-2.00E-04
CRU [kg]	–	–	–	–	–	–
MER [kg]	–	–	–	–	–	–
EE [MJ, LHV]	–	–	–	–	–	–

Caption	HWD = hazardous waste disposed; NHWD= non-hazardous waste disposed; HLRW = high-level radioactive waste, conditioned, to final repository; ILLRW = intermediate and low-level radioactive waste, conditioned to final repository; CRU= components for reuse; MR=materials for recycling; MER=materials for energy recovery; EE= Recovered energy exported from the product system

Table 11. Carbon Emissions and Removals

Parameter	A1-A3	A4	A5	B2	C2	C4
BCRP [kg CO2]	9.01E+00	7.07E-03	1.86E-01	2.27E-02	2.82E-04	-5.59E-03
BCEP [kg CO2]	4.34E+00	6.86E-03	9.08E-02	2.30E-02	2.73E-04	6.19E-03
BCRK [kg CO2]	1.63E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCEK [kg CO2]	6.62E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCEW [kg CO2]	–	–	–	–	–	–
CCE [kg CO2]	–	–	–	–	–	–
CCR [kg CO2]	–	–	–	–	–	–
CWNR [kg CO2]	–	–	–	–	–	–

Caption	BCRP [kg CO2] = Biogenic Carbon Removal from Product; BCEP [kg CO2] Biogenic Carbon Emission from Product; BCRK [kg CO2] = Biogenic Carbon Removal from Packaging; BCEK [kg CO2] = Biogenic Carbon Emission from Packaging; BCEW [kg CO2] = Biogenic Carbon Emissions from Combustion of Waste; CCE [kg CO2] = Calcination Carbon Emissions; CCR [kg CO2] = Carbonation Carbon Removal; CWNR [kg CO2] = Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes

5. LCA Interpretation

The life cycle impacts of modular carpets are driven by the Product Stage and the impacts form this stage are driven by raw materials. Yarns and backing materials are the major contributors to impacts. Recycled polymers in both yarns and backings greatly reduce the impacts as compared to virgin petrochemicaly based materials previously used in Interface carpet manufacture.

6. Additional Environmental Information

6.1. Environment and Health During Manufacturing

More information on product stewardship can be found on Interface's sustainability website.

6.2. Environment and Health During Installation

All reccomendations shall be utilized as inicated by SDS and installation guidelines.

6.3. Extraordinary Effects

Fire

NAME	VALUE
Radiant panel (ASTM E-648)	**Class 1**
Smoke density (ASTM E-662)	**< 450**

Water

The product's backing is impervious to water, protecting the subfloor from leaks and spills. Exposure to flooding for long periods may result in damage to the product.

Mechanical Destruction

The product is intended for commercial applications with heavy wear (CRI Test method 101 Appearance Retention Rating). Performance requires proper installation according to Interface installation guidelines.

6.4. Environmental Activities and Certifications

All environmental activites and certifications can be found on Interface's sustainability website.

6.5. Further Information

For more information on the CQUEST™ backings visit Interface's website.

7. References

EN 15804: EN 15804:2012-04+A1 2013: Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products

GaBi 9 (2019). Software-System and Databases for Life Cycle Engineering Copyright, TM. Stuttgart, Echterdingen

Interface, Inc (2020). Life Cycle Assessment of CQuest™ BioX.

ISO 14025: DIN EN ISO 14025:2011-10: Environmental labels and declarations - Type III environmental declarations- Principles and procedures

ISO 14040 (2006). Environmental management - Life cycle assessment – Principles and framework

ISO 14044 (2006). Environmental management - Life cycle assessment – Requirements and guidelines

ISO 21930: 2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services

UL Environment General Program Instructions version 2.5, March 2020

UL Environment (2018) Product Category Rules for Building-Related Products and Services, adapted for UL Environment from the range of Environmental Product Declarations of institute Construction and Environment e. V. (IBU) Part A Calculation Rules for the Life cycle Assessment and Requirements on the Project Report

UL Environment (2020) PCR Guidance- Texts for Building-Related Products and Services. Part B: Requirements on the EPD for Floor coverings