EPD™

Environmental Product Declaration

Global GreenTag^{CertTM} EPD Program

Compliant to EN 15804:2012+A1 2013

Polyflor Ltd

Safety Flooring

Polysafe Ultima

Polyflor Ltd., Leicester Rd, Whitefield, Manchester M 45 7NG, United Kingdom

POLYFLOR™
COVERING THE WORLD

Compliant to EN 15804:2012 +A1 2013 ISO 14025 ISO 21930

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EPD Verification and LCA Details

EPD Scope	Cradle to Gate
EPD Number	PLF HS1 2021EP
Issue Date	10 August 2021
Valid Until	10 August 2026

Demonstration of Verification

CEN standard EN 15804 serves as the core Product Category Rules (PCR)

Independent external verification of the declaration and data, according to ISO 14025:2010

☒ External 10th Aug 2021 — Third Party Verifier[a] Shloka Ashar, Sustainability Consultant

LCA Reviewed by Shloka Ashar, Sustainability Consultant

☒ Internal 22/09/21 — EPD Reviewed by David Baggs, Global GreenTag Pty Ltd

a: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

The EPD is property of declared manufacturer. Different program EPDs may not be comparable as e.g. Australian transport is often more than elsewhere. Comparability is further dependent on the product category rules used and the source of the data. Further explanatory information is found at info@globalgreentag.com or contact: certification1@globalgreentag.com.

This EPD discloses potential environmental outcomes compliant with EN 15804 for business-to-business communication.

LCIA results are relative expressions that do not predict impacts on category endpoints, exceeding of thresholds, safety margins or risks.

EPD Program Operator	LCA and EPD Producer	Declaration Owner
Global GreenTag Pty Ltd	The Evah Institute	Polyflor Ltd
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Product Information

Product name	Polyflor Safety Flooring		
Product codes	Polysafe Ultima		
Declared Unit	The declared product per kilogram		
Product Specifications	Ultima is 2.5mm gauge homogeneous flooring		
Standards	EN 13845:2017 Resilient floor coverings - Polyvinyl chloride floor coverings with particle based enhanced slip resistance – Specification		
Manufacture Site	Leicester Rd, Whitefield, Manchester M 45 7NG, United Kingdom		
Factory Warranty	10 years		
Representation Site & Geography	United Kingdom, Europe, Pacific Rim and Australasia		
Functional & Technical Performance	**Property**	**Conformance to Standard**	**Polysafe Ultima**
	Performance	EN 13845	Conforms
	Reaction to Fire	EN 13501-1 Class	Bfl-S1
	Use Area	EN 685/ISO 10874	23, 34 & 43
	Slip Resistance	DIN 51130	R11
	VOC Emissions	Indoor Air Comfort	Eurofins Gold certified
		AgBB/ABG	Pass
Data quality, range & variability	Cut-off criteria and data quality complies with EN 15804 Significant differences of average LCIA results are declared		
Primary Data	Data was collected in accordance with EN ISO 14044:2006, 4.3.2, from primary sources including the manufacturer, suppliers and their publications on standards, locations, logistics, technology, market share, management systems and commitments to improved environmental performance.		
No Chemicals of Very High Concern	Contains no substances in the “Authorised or Candidate Lists of Substances of Very High Concern (SVHCs)” with the European Chemicals Agency		

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Program Description

EPD type	Cradle to gate (A1 to A3) as defined by EN 15804 and depicted in Figure 1
System boundary	The system boundary with nature includes material and energy system input processing plus manufacture and transport to factory gate plus waste arising.
Service Life	The reference service life is unspecified for cradle to gate scope
Comparability	Construction product EPDs may not be comparable if not EN15804 compliant
Stages included	A1, A2, A3 as depicted and denoted by x in Figure 1
Stages excluded	A4-5, B1-7, C1-1& D as depicted and denoted by MND in Figure 1
Product stages included	Stages are included from A1 raw material acquisition, extraction, refining and processing plus reuse of scrap or material from previous systems; electricity generated from all sources with extraction, refining & transport; plus, secondary fuel energy and recovery processes. Also, A2 transport internal and to the factory gate as well as A3 manufacture of product packaging, inputs, ancillary material and system flows leaving at end-of-waste boundary as coproducts

Information Modules

As Figure 1 shows an x marking LCA and EPD results to be shown summed for modules A1-3. Modules A4 to C4 and D are not declared marked MND which does not indicate zero inventory or impact.

Model	Actual					Scenarios											Potential		
Phase	Produce			Construct		Building Fabric					Building Use		End of life				Beyond Boundary		
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D1,	D2	D3
Unit Operations	Resource supply	Transport	Manufacturing	Transport	Construction	Use	Maintain	Repair	Replace	Refurbish	Operating Energy	Operating Water	Demolish	Transport	Process Waste	Disposal	Reuse	Recovery	Recycling
Cradle to Gate	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Figure 1 Life Cycle Phases and Declared Stages in Cradle to Grave Boundary

Base Material Origin and Detail

Table 1 lists product composition by function, component, source and mass share amount.

Function	Component	Source	Polysafe Ultima
Binder	PVC	EU	>45<50
Filler	Dolomite	UK	>20<25
Plasticiser	Dioctyl Terephthalate	Sth. Korea	>20<25
Grip & Wear	Silicon Carbide	UK	>5<10
Grip & Wear	Coloured Quartz	Germany	>3<8
Carrier	Fibreglass PVA Crenette	UK EU	>1<3
Plasticiser	Epoxidised Esters	UK	>1<3
Grip & Wear	Black quartz	UK	>1<3
Colour	Pigment Paste	UK	>0.5<2
Colour	PVC Chip	EU	>0.5<2
Filler	Recycled Glass	UK	>0.5<2
Stabiliser	Barium Zinc Soap	UK	>0.3<1
Various	Pigment & biocide	Global	>0.1<1

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Scope and System Boundary

Figure 1 shows included processes in a cradle to gate system boundary and dashed lines defining excluded scenarios to end of life fate to recycling or to landfill grave.

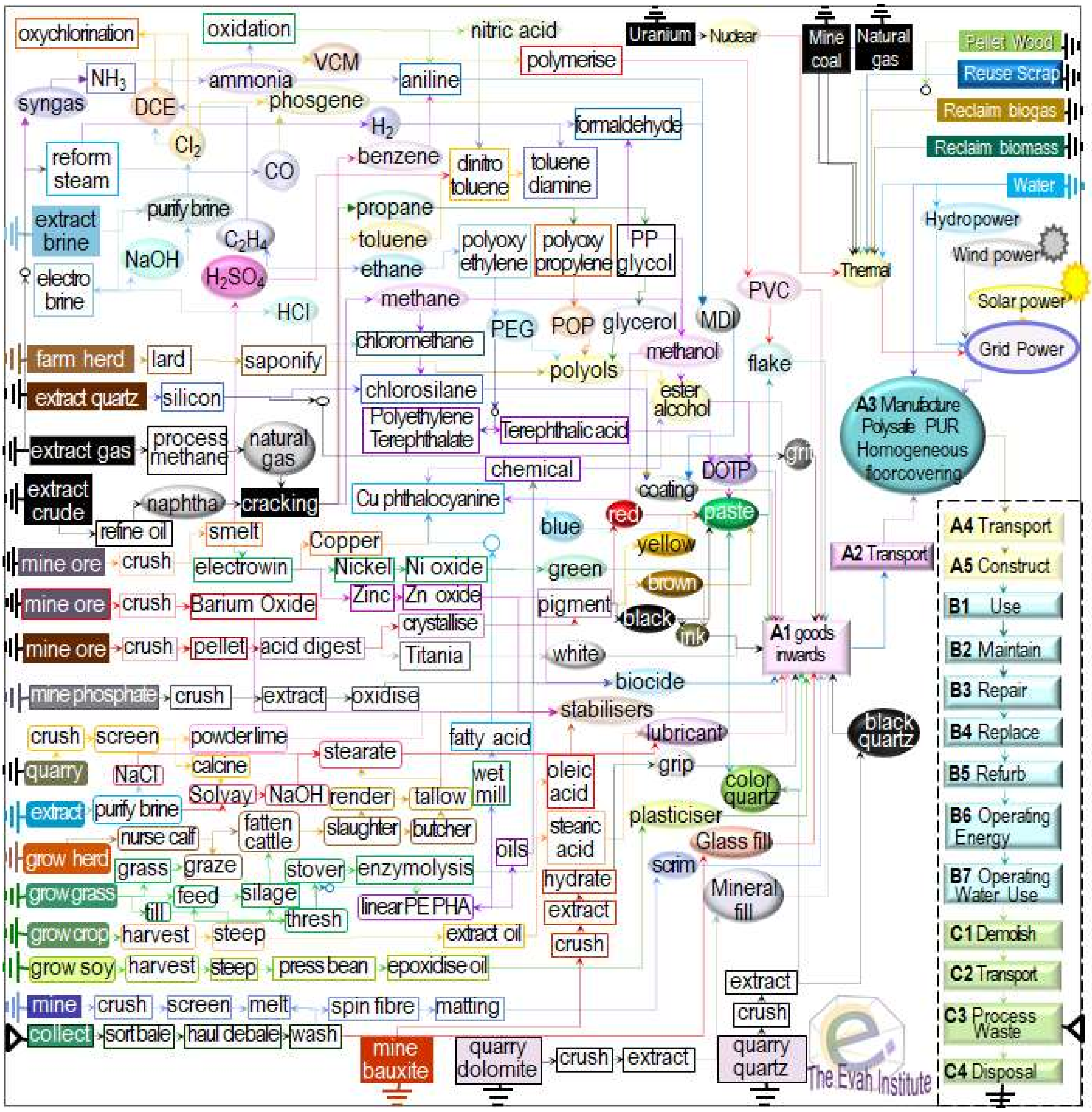

Figure 1 Process Flow Chart

Environmental Impact Terminology

Environmental impacts contributing to risks of social and ecological issues and collapse are tabled below with ***common names*** and remedies given for each indicator listed in subsequent results tables.

Global warming potential (GWP). forcing climate change.	Greenhouse gases absorb infra-red radiation. This heat reduces thermal energy differentials, from equator to poles, forcing ocean current and wind circulation to blend and regulate climate. Weakly blended "lumpier" weather has more frequent, extreme heat wave, wildfire, cyclone, storm, flood and blizzard events. Accumulation of carbon dioxide, natural gas methane, nitrous oxides and volatile organic compounds from burning fossil fuels causes global warming. Forest and wilderness growth absorbing air-borne carbon in biomass can drawdown such accumulation. Urgent renewable energy reliance is vital in time to avoid imminent tipping points and the worsening "***climate emergency"***.
Ozone depletion potential	Stratospheric ozone loss weakens the planet's solar shield so more shorter wavelength ultraviolet (UVB) light reaching earth damages plants and increases malignant melanoma and skin cancer in humans and animals. Chlorofluorocarbons, hydrochlorofluorocarbons (HCFC), chlorobromomethane, hydrobromofluorocarbons, carbon tetrachloride, methyl chloroform, methyl bromide and halon gas cause ozone layer loss. To repair the ***"ozone hole"*** reliance on ozone-safe refrigerants, aerosols and solvents is essential to avoid further its depletion and enable accumulation of naturally-formed ozone.
Acidification potential of land and water	Acidification reduces soil and waterway pH, impedes nitrogen fixation vital for plant growth and inhibits natural decomposition. It increases rates and incidence of fish kills, forest loss and deterioration of buildings and materials. Chief synthetic causes of ***"acid rain"*** are emissions of sulphur and nitrogen oxides, hydrochloric and hydrofluoric acids and ammonia from burning fossil fuels polluting rain and snow precipitation world-wide.
Eutrophication potential	Eutrophication from excessively high macronutrient levels added to natural waters promotes excessive plant growth that severely reduces oxygen, water and habitat security for aquatic and terrestrial life across related ecosystems. Chief synthetic cause of "***algal blooms"*** is nitrogen (N, NOx, NH_4) and phosphorus (P, PO_4^{3-}) in rain run-off across over-fertilised land catchments.
Photochemica l ozone creation potential	Tropospheric photochemical ozone, called ***smog*** near ground level, is created from natural and synthetic compounds in UV sunlight. Low concentration smog damages vegetation and crops. High concentration smog is hazardous to human health. Chief synthetic causes are nitrogen oxides, carbon monoxide and volatile organic compounds (VOC) pollutants. Avoiding reliance on dirtiest coal fuel and volatile chemicals has reduced smog incidence in many areas globally.
Abiotic depletion potential minerals and metals (elemental)	Abiotic depletion of finite mineral resources increases time, effort and money required to obtain more resources to the point of extinction of naturally viable reserves. This limits future accessibility to vital technical, medicinal and chemical resources. The youth movement "***extinction rebellion"*** calls on adults to secure ore reserves, biodiversity and climate for current and future generations.
Abiotic depletion potential fossil fuel	Abiotic depletion of resources by consuming finite oil, natural gas, coal and nuclear fossil fuel reserves leaves current and future generations suffering limited available, accessible, plentiful, essential valuable as well as scarce raw material, medicinal, chemical, fuel and feedstock. Approaching "***peak oil"*** acknowledges fossil fuel reserves are finite and the need for decision-makers to act to avoid market instability, insecurity and or oil and gas wars.

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Cradle to Gate Inventory and Potential Impact Results

Table 2 shows inputs, outputs and potential impacts per declared unit.

Table 2 Resource Amounts A1-A3 /kg

Inventory Input Categories	Unit	Polysafe Ultima
Net Fresh Water	m^3	0.42
Secondary Material	kg	0.20
Secondary Renewable Fuel	MJ ncv	0.E+00
Secondary Non-renewable Fuel	MJ ncv	0.31
Primary Renewable Energy Not Feedstock	MJ ncv[1]	9.6
Primary Renewable Feedstock Material Energy	MJ ncv	0.55
Primary Renewable Energy Resources	MJ ncv	10
Primary Non-renewable Energy Not Feedstock	MJ ncv	47
Primary Non-renewable Feedstock Energy	MJ ncv	19
Total Primary Non-renewable Energy Resources	MJ ncv	66
Inventory Output Categories		
Hazardous Waste Disposed	kg	2.2E-03
Non-hazardous Waste Disposed	kg	0.53
Radioactive Waste Disposed	kg	1.3E-09
Components for Reuse	kg	0.34
Material for Recycling	kg	0.70
Material for Energy Recovery	kg	2.1E-03
Exported Electrical Energy	MJ ncv	0.E+00
Exported Thermal Energy	MJ ncv	0.E+00
Potential Impact Categories		
Global Warming	kg CO_{2e}	3.0
Stratospheric Ozone Depletion	kg $R11_e$	1.3E-09
Photochemical Ozone Creation	kg C_2H_{4e}	1.2E-02
Acidification of Land and Water	kg SO_{2e}	7.8E-03
Eutrophication	kg PO_{4e}^3	1.9E-03
Abiotic Depletion Fossil Fuel	MJ ncv	3.2
Abiotic Depletion Mineral (Elemental)	kg Sb_{eq}	3.9E-03

[1] ncv stands for net calorific value

Interpretation of Results Cradle to Gate

The majority of impacts derive from the binder. Components embodied 98% EE and 99% GWP mostly from supply chain fossil fuel. Per kg dispatched product packaging gross embodied energy (EE) input share was 2% and Global Warming (GWP) emissions share was 1%. Except for lowest impact minerals, component mass share correlated with gross EE and GWP/kg product.

On average, the Whitefield factory manufacturing used only 17% gross energy with 13% being electrical and 4% gas fuel with GWP emissions 12% and 5% shares respectively. While factory power supply is predominantly renewable all fuel was transported and most wood scrap fuel was shipped from North America.

Overall, of the gross product input 85% EE was fossil fuelled with 15% from renewable sources. On average 74% was fossil fuelled and 26% was feedstock that is recoverable at end of product life via material re-use or transformation to energy. Of gross, on average 59% EE was burnt as fossil fuels, 26% retained in fossil feedstock, 14% used as renewable energy and 1% retained in renewable feedstock. Of the gross primary non-renewable energy 69% was used as fuel and 31% was retained in feedstock. Of the gross renewable energy 95% was used and 5% retained in feedstock material.

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GreenTag™ 2021 http://www.globalgreentag.com/get-certified

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