

Global GreenTag EPD Program: Compliant to ISO14025



Heterogeneous Polysafe Vogue Ultra PUR and Polysafe Standard PUR Floorcovering

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



Polysafe Standard PUR and Polysafe Vogue Ultra PUR Heterogeneous Flooring

Table of Contents

Headi	ng	Page
1.	Details of This Declaration	3
2.	Product Characterisation	3
3.	Verification of this Declaration	3
4.	Green Star® Certified Credits	3
5.	Base Material Origin and Detail	4
6.	Life Cycle Impact Results	4
7.	Packaging, Installation, Use & Disposal	5
8.	Whole of life Performance	5
9.	Supply Chain Modelling	6
10.	Life Cycle Assessment Method	7
11.	Data Sources Representativeness and Quality	8
12.	Supply Chain Modelling Assumptions	9
13.	References for this LCA & EPD	10
14.	Reviewers Report Conclusions	11

This Environmental Product Declaration (EPD) discloses potential environmental outcomes compliant with ISO 14025 for business-to-business communication. Different program EPDs may not be comparable as e. g. Australian transport is more than elsewhere. **Further explanatory information is found at** <u>http://www.globalgreentag.com/ or contact: certification@globalgreentag.com</u> © This EPD remains the property of Global GreenTag Pty Ltd.



Polysafe Standard PUR and Polysafe Vogue Ultra PUR Homogeneous Flooring

1. Details of This Declaration

The declared Heterogeneous Polysafe PUR flooring was made by Polyflor Ltd at Manchester in the United Kingdom in 2018 for sale with a 10-year warranty. It is depicted inset and on the cover. More detail is at <u>www.polyflor.com.au</u>

Program	GreenTag Global Pty Ltd hereafter	
Operator	called Global GreenTag	
EPD Number	PFL:HS03:2021	
Date issue	9th February 2022	
Validity	9th February 2025	
Reference PCR	Compliant with PCR IF:2021 Floorcovering	gs
Time	Made in and sold from 2017 for 20 years u	lse
Geography	Made in United Kingdom. Uses are assum	ned as for Australasia
Application	Homogeneous floorcovering for enhanced	resilience, safety and cleaning
Functional units	Polysafe Homogeneous floorcovering per	square metre 20y use cradle to grave

2. Product Characterisation

- **Definition** Heterogeneous Polysafe PUR Floorcovering made by Polyflor Ltd for enhanced resilience, safety and cleaning in all building sectors
- **Standard** BS EN ISO 13845: 2017 Resilient floor coverings Polyvinyl chloride floor coverings with particle based enhanced slip resistance Specification

3. Verification of this Declaration

This EPD was approved on 23rd April 2021 according to requirements of ISO14025 8.1.3b.

Role	Name	Position	Signature
PCR Review Chair	Murray Jones	Ecquate Pty Ltd CEO	1 10 M 28-04-2021
LCA & EPD Developer	Mathilde Vlieg	VliegLCA Consultant	amm Mleg 22-04-2021
3 rd Party LCA Verifier	Delwyn Jones	The Evah Institute CEO	Dehyn Jones 28 04 2021
Internal EPD Audit	David Baggs	Global GreenTag CEO & Program Director	9.2.2022

4. Green Star® Certified Credits

Products are relevant to the Green Building Council of Australia's (GBCA) Green Star® scheme. If required this EPD is evidence the declared product meets the following Green Star® credits. It may be used as evidence in Green Star® submissions for those credits. The product is certified by GBCA recognised Global GreenTag GreenRate to meet the following credits of Green Star®:

- Interiors V1.3: Sustainable Products
- Design and As Built V1.3: Sustainable Product
- Performance V1.2: Refurbishment Materials

GBCA Disclaimer

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Polysafe Standard PUR and Polysafe Vogue Ultra PUR Heterogeneous Flooring

5. Base Material Origin and Detail

Table 1 lists key components by function, type, source and mass grams per kg of product output. All components to <0.001% were modelled but only content >1% is declared to protect intellectual property.

Function	Component	Source	Polysafe Vogue Ultra PUR	Polysafe Standard PUR
Binder	PVC	EU	>45<50	>45<50
Filler	Dolomite	UK	>28<33	>27<32
Plasticiser	Diisononylphthalate	Czech	>17<22	>17<22
Grip & Wear	Coloured Quartz	Germany	>2<5	>2<5
Grip & Wear	Silicon Carbide	UK	>1<3	>1<3
Carrier	Fibreglass PVA	UK EU	>2<5	>2<5
Plasticiser	Epoxidised Esters	UK	>1<3	>1<3
Colour	Pigment Paste	UK	>0.5<2	>0.5<2
Grip & wear	Black Quartz	UK	>2<5	>2<5
Filler	Recycled Glass	UK	>0.5<1	>0.5<2
Colour	PVC Flake	EU	>0.5<1	
Coating	Polyurethane	UK	>0.1<1	>0.1<1
Stabiliser	Barium Zinc Soap	UK	>0.3<1	>0.3<1
Various	Pigment, dye & biocide	global	>0.1<1	<0.1

Table 1 Product Base Material

6. Life Cycle Impact Results

Table 2 shows Life Cycle Inventory and Impact Assessment potential results for 20 years product use/m².

Table 2 Cradle to Grave LCI and LCIA Results/ m² Functional Unit

Inventory Totals	Unit	Polysafe Vogue Ultra PUR	Polysafe Standard PUR
Product Mass	kg	2.54	2.53
Embodied Water	kl	0.51	0.54
Renewable Primary Energy	MJ	29	33
Fossil Fuel Primary Energy	MJ	181	199
Impact Potential Totals			
Global Warming	kg CO _{2e 100}	6.8	7.4
Stratospheric Ozone Loss	kg R11 _e	1.0E-9	1.1E-9
Acidification Land & Water	kg SO _{2e}	0.12	0.13
Eutrophication of Water	kg PO ₄ ³⁻ e	5.0E-3	5.4E-3
Ecosystem Quality Damage	PDF*m ² *yr	9.5E-5	1.0E-4
Human Health Damages	DALY	6.6E-4	7.1E-4
Depletion of Fossil Fuel	MJ _{surplus}	6.2	6.8
Depletion of Minerals	MJ _{surplus}	0.29	0.34

Page 5 of 12



Compliant to ISO 14025

Polysafe Standard PUR and Polysafe Vogue Ultra PUR Heterogeneous Flooring

7. Packaging, Installation, Use & Disposal

Packaging	Cardboard forms & cartons, plastic wrap & strapping on reused pallets.
Service life	Residential and commercial refits vary but 20-year life is assumed typical.
Health Safety & Environment	Apart from compliance to occupational and workplace health safety and environmental laws no additional personal protection is considered essential.
Residual Scrap	Mill off-cuts are reclaimed. Installation scrap of 5% is assumed to landfill.
	The recommended cleaning and maintenance raise no ecosystem or human health concerns.
Maintenance	Care and maintenance guides are on company websites.
	Weekly detergent spray, light mop, monthly wet machine scrub and cloth dry.
Recycling	Home mill, fabrication and installation scrap is reworked into new product.
Re-use	This study assumes 60% product is serviceable for reuse over 40 more years.
Disposal	It assumes 30% is recycled. Incineration is rare in Australia so none is modelled.

8. Whole of life Performance

Health Protection	The product does not contain levels of carcinogenic, toxic or hazardous substances that warrant ecological or human health concern cradle to grave. No issues or red-light concerns existed for product human or ecological toxicity.							
Effluent	The LCI results raised no red-light concerns in emissions to water1.							
Waste	Cradle to grave waste to landfill was 1% hazardous and 99% non-hazardous.							
Environmental Protection	Continuous improvement under the maker's ISO14001 EMS aims to avoid toxics, waste and pollution plus reduce their material and energy use.							
Environmental	Installed products have been tested to international standards as having low VOC emissions.							
Health Effects	No other potential in-use impacts on environment or health are known.							

¹ According with national standards in ANZECC Guideline for Fresh & Marine Water Quality (2000)



Polysafe Standard PUR and Polysafe Vogue Ultra PUR Heterogeneous Flooring

9. Supply Chain Modelling

Processes to acquire, refine, transport, fabricate, coat, use, clean, repair, reuse and dispose of metal, masonry, ceramic, timber, glass, plastic and composites are modelled from cradle to grave. The study excludes scope 3 burdens from building capital facilities, churn, equipment; noise and dehydration as well as incidental activities and travel of production employees. Figure 1 shows system operations including:

- Mining, extracting and refining resources to make commodities and packaging;
- Acquiring, cultivating, harvesting, extracting, refining produce and biomass;
- Fuel production to supply power and process energy and freight;
- Chemicals use in processing resources, intermediates and ancillaries;
- Process energy, fuel and freight of resources, intermediates and ancillaries;
- Use, cleaning, recoating, repair, recycling, re-use and landfill, as well as
- Infrastructure process energy transformed and material wear loss e. g. tyres.

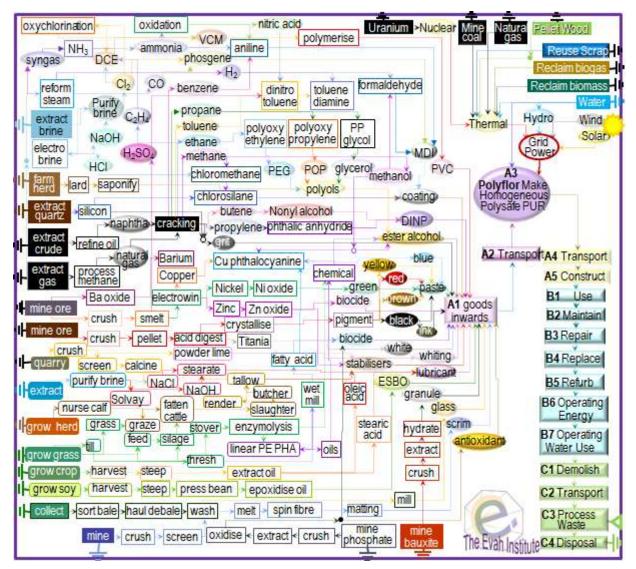


Figure 1 Major Product Operations

Polysafe Standard PUR and Polysafe Vogue Ultra PUR Heterogeneous Flooring

10. Life Cycle Assessment Method

LCA Author Study Period LCA Method	Factory data Compliant w	The Evah Institute as described at <u>www.evah.com.au</u> Factory data was collected from 2015 to 2018 Compliant with ISO 14040 and ISO 14044 Standards)				
LCIA method Scope Phases Assumptions	EcoIndicator 99 Life Cycle Impact (LCIA) Assessment Cradle to Fate including all supply chain phases and stages depicted in Figure a. The LCA covered all known flows in all known stages cradle to end of life fate. Use is to typical Australian Facility Management professional practice.																	
Scenarios	Use, cleanin Facility Mana	Use, cleaning, maintenance plus disposal and re-use were scenario-based using Facility Management Association denoted and published typical operations.																
System Boundaries	A1-A3 proA4 packagB1 use with	 The LCA system boundary depicted in Figure a includes all operations A1-A3 production with upstream supply & transport; A4 package & deliver & A5 construct; B1 use with cleaning, B2 maintain, B3 repair, B5 refurbish, C1 demolish, C2 transport and C4 disposal 																
Processes	All significant resource acquisition, water, fuel & energy use, power generation & distribution, freight, refining, intermediates, manufacture, scrap re-use and goods inwards packaging are included cradle to gate. Cradle to Grave scope includes packing and dispatch as well as installation, use, maintenance, landfill waste and emission flows from all supply chain operations involved to make, pack and install repair and demolish product.																	
Modeling			tual	•		nario	S									P	oten	tial
Phases		Pr	odu	ice	Cons	truct	Building Fabric & Operation			End of life			•	Beyond Boundary				
Modules		A1	A2	A3	A4	A5	В1	B2	B3	B4	B5	C1	C2	СЗ	C4	D 1	, 2 3	3
Unit Operations		Resource supply	Transport	Manufacturing	Transport	Construction	es D B6 0 B7 0	101100		0.1.0100.02			Transport	Process Waste	Disposal	Reuse	Recovery	Recycling
Cradle to Grave	tions	Mandat					Manda						1211-121				Optic	onal
		ead	1 ph	ase	Optional for each and every phase Optional						Optic	mai						

Figure a Phases and Stages Cradle to Grave

Evah industry databases cover all known domestic and global scope 1 and 2 operations. They exclude scope 3 burdens from capital facilities, equipment churn, noise and dehydration as well as incidental activities and employee commuting. The databases exist in top zones of commercial global modelling and calculating engines. Electricity supply models in active databases are updated annually. As each project is modelled with new data the databases are updated and audited by external 3rd party verifiers. Quality control methods ensure:

- Coverage of place in time with all information for each dataset noted, checked and updated;
- Consistency to Evah guidelines for all process technology, transport and energy demand;
- Completeness of modeling based on in-house reports, literature and industry reviews;
- Plausibility in 2-way checks of LCI input and output flows of data checked for validity, plus
- Mathematical correctness of all calculations in mass and energy balance cross checks.



Polysafe Standard PUR and Polysafe Vogue Ultra PUR Heterogeneous Flooring

11. Data Sources Representativeness and Quality

Primary data used for modelling the state of art of each operation includes all known process for:

- Technology sequences;
- Energy and water use;

- Reliance on raw and recycled material;
- High and reduced process emissions;

Landfill and effluent plus

Freight and distribution systems.

Primary data is sourced from clients, Annual Reports and their publications on corporate locations, logistics, technology use, market share, management systems, standards and commitment to improved environmental performance. Information on operations is also sourced from client:

- Supply chain mills, their technical manuals, corporate annual reports and sector experts, and
- Manufacturing specifications websites and factory site development license applications.

Background data is sourced from the International Energy Agency, IBISWorld, USGS Minerals, Franklin Associates, Boustead 6, Plastics Europe, CML2, Simapro 8, EcoInvent 3 and NREL USLCI model databases. Information on operations is also sourced from:

- Library, document, NPI and web searches, review papers, building manuals and
- Global Industry Association and Government reports on Best Available Technology (BAT).

For benchmarking, comparison and integrity checks inventory data is developed to represent BAT, business as usual and worst practice options with operations covering industry sector supply and infrastructure in Australia and overseas.

Such technology, performance and license conditions were modelled and evaluated across mining, farming, forestry, freight, infrastructure and manufacturing and building industry sectors since 1995.

As most sources do not provide estimates of accuracy, a pedigree matrix of uncertainty estimates to 95% confidence levels of Geometric Standard Deviation² (σ_g) is used to define quality as in Table a².

Correlation	Metric σg	U ±0.01	U ±0.05	U ±0.10	U ±0.20	U ±0.30
Dellability	Reporting	Site Audit	Expert verify	Region	Sector	Academic
Reliability	Sample	>66% trend	>25% trend	>10% batch	>5% batch	<1% batch
0 1 <i>0</i>	Including	>50%	>25%	>10%	>5%	<5%
Completion	Cut-off	0.01%w/w	0.05%w/w	0.1%w/w	0.5%w/w	1%w/w
Temporal	Data Age	<3 years	≤5 years	<10 years	<15 years	>16 years
	Duration	>3 years	<3 years	<2 years	1 year	<1 year
0	Focus	Process	Line	Plant	Corporate	Sector
Geography	Range	Continent	Nation	Plant	Line	Process
Technology	Typology	Actual	Comparable	In Class	Convention	In Sector

Table a Data	Quality	Parameters and	d Uncertainty (U)
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No data set with >±30% uncertainty is used without notation in the LCA as well as the EPD.

² Evah Institute data quality control system accords with UNEP SETAC Global LCI Database Quality 2010 Guidelines



Polysafe Standard PUR and Polysafe Vogue Ultra PUR Heterogeneous Flooring

12. Supply Chain Modelling Assumptions

Australian building sector rules and Evah assumptions applied are defined in Table b.

Table b Scope Boundaries Assumptions and Metadata

Quality/Domain N	lational including Import and Export
Process Model T	ypical industry practice with currently most common or best (BAT) technology
Resource flows R	Regional data for resource mapping, fuels, energy, electricity and logistics
Temporal P	Project & background data was collated 3 years to declaration approval date.
Geography D	Designated client, site, regional, national, Pacific Rim then global jurisdiction
Representation D	Designated client, their suppliers and energy supply chains back to the cradle
Consistency M	Nodel all operations by known given operations with closest proximity
Technology T	ypical of global or Pacific Rim supply chain 3 years to declaration approval date.
Functional Unit T	ypical product with cleaning & disposal used for declared years' service life/m ²
System Control	
Primary Sources C	Clients and supplier mills, publications, websites, specifications & manuals
Other Sources IE	EA, USGS Minerals, IBISWorld, Boustead, Government & Industry reports
Data mix P	Power grid & renewable shares updated to latest IEA & power generator reports
Operational C	Company data for process performance, product share, waste and emissions
Logistics Logistics	ocal data is used for power, fuel mix, water supply, logistics share & capacity
New Data Entry V	/liegLCA, Evah Institute; Global Green Tag Researchers at declaration date.
Data Generator M	Ianufacturers, Evah Institute; GGT; Meta: IBIS, Other pre-publication date
Data Publisher T	he Evah Institute Pty Ltd to Global GreenTag and designated client only
Persons input A	Il contributors cited in Evah & Global GreenTag records or websites
Data Flow & Mix	
System Boundary E	Earth's cradle of all resource & emission flows to end of use, fitout or build life
System flows A	All known from and to air, land, water and community sources & sinks
Capital inclusions N	latural stocks Δ , industry stockpiles Δ , capital wear Δ , system losses and use
Arid Practice D	Dry technology adopted; Water use is factored by 0.1 as for e.g. Mining
Transportation D	Distance >20% than EU; >20% fuel efficient larger vehicles, load & distance
Industrial C	Company or industry sector data for manufacturing and minerals involved
Mining A	Il raw material extraction is based on Australian or Pacific Rim technology
Imported fuel N	lix is from nearest sources is e.g. UAE, SE Asia, Canada or New Zealand
Finishes P	Processing inputs with finishing burdens are factored in. If not, that is denoted
Validation	
Accuracy 1	0^{th} generation study is ± 5 to 15% uncertain due to some background data
Completeness A	Il significant operations are tracked and documented from the cradle to grave
Precision >	
Allocation %	90% flows are track with a 90:10 rule applied sequentially to 99.9% and beyond
Burdens A	90% flows are track with a 90:10 rule applied sequentially to 99.9% and beyond 6100 to co products on reaction stoichiometry by energetic or mass fraction
Burdens A	
	6100 to co products on reaction stoichiometry by energetic or mass fraction
Plausibility R	6100 to co products on reaction stoichiometry by energetic or mass fraction All resource use from & emissions to community, air, lands & waters are included



Polysafe Standard PUR and Polysafe Vogue Ultra PUR Heterogeneous Flooring

13. References for this LCA & EPD

Australian & New Zealand (ANZECC) Guidelines For Fresh & Marine Water Quality (2000) http://www.environment.gov.au/water/quality/national-water-quality-management-strategy Basel Convention (2011) Control of Transboundary Movement of Hazardous Waste & Disposal http://www.basel.int/portals/4/basel%20convention/docs/text/baselconventiontext-e.pdf Boustead (2014) Model 6 LCI database http://www.boustead-consulting.co.uk/publicat.htm USA & UK Ecolnvent (2016) LCI Model 3 database http://www.ecoinvent.ch/ Ecolnvent, Switzerland Evah (2021) LCA Tools, Databases & Methodology at http://www.evah.com.au/tools.html Franklin Associates (2016) US LCI Database http://www.fal.com/index.html Eastern Research Group US GreenTag[™] Certification (2021) http://www2.ecospecifier.org/services_offered/greentag_certification GreenTag[™] (2021) Product Category Rules <u>http://www.globalgreentag.com/greentag-epd-program</u> Jones D., Mitchell. P. & Watson P. (2004) LCI Database for Australian Commercial Building Material: Report 2001-006-B-15, Sustainable Built Assets, CRC for Construction Innovation Jones D.G et al. (2009) Chapter 3: Material Environmental LCA in Newton P et al., (eds) Technology, Design & Process Innovation in the Built Environment, Taylor & Francis, UK IBISWorld (2021) Market Research, http://www.ibisworld.com.au/ IBISWorld Australia International Energy Agency (2016) Energy Statistics http://www.iea.org/countries/membercountries/ ISO 9001:2008 Quality Management Systems Requirements ISO 14001:2004 Environmental management systems; Requirements with guidance for use ISO 14004:2004 EMS: General guidelines on principles, systems & support techniques ISO 14015:2001 EMS: Environmental assessment of sites & organizations (EASO) ISO 14020:2000 Environmental labels & declarations — General principles ISO 14024:2009 Environmental labels & declarations -- Type I Principles & procedures ISO 14025:2006 Environmental labelling & declarations Type III EPDs Principles & procedures ISO 14031:1999 EM: Environmental performance evaluation: Guidelines ISO 14040:2006 EM: Life cycle assessment (LCA): Principles & framework ISO 14044:2006 EM: LCA: Requirement & guideline for data review: LCI; LCIA, Interpretation results ISO 14064:2006 EM: Greenhouse Gases: Organisation & Project reporting, Validation & verification ISO 15392:2008 Sustainability in building construction General principles ISO 15686-1:2011 Buildings & constructed assets Service life planning Part 1: General principles ISO 15686-2:2012 Buildings & constructed assets Service life (SL) planning Part 2: prediction ISO 15686-8:2008 Buildings & constructed assets SL planning Part 8: Reference & estimation ISO 21929-1:2011 Sustainability in building construction Sustainability indicators Part 1: Framework ISO 21930:2007 Building construction: Sustainability, Environmental declaration of building products ISO/TS 21931-1:2010 Sustainability in building construction: Framework for assessment, Part 1: ISO 21932:2013 Sustainability in buildings and civil engineering works -- A review of terminology Plastics Europe (2021) Portal http://www.plasticseurope.org/plastics-sustainability/eco-profiles.aspx Pre (2016) SimaPro 8 Software, The Netherlands http://www.pre-sustainability.com/simapro-manuals Mvhre et al. 2013, Anthropogenic and Natural Radiative Forcing Chapter 8 in Stocker et al (eds.) Climate Change 2013, AR5 of the IPCC, Cambridge U Press UK. http://www.ipcc.ch/report/ar5/wg1/ UNEP (2016) Persistent Organic Pollutants http://www.chem.unep.ch/pops/ The UN USLCI (2019) Life-Cycle Inventory Database https://www.lcacommons.gov/nrel/search, USA U.S. Geological Survey National Minerals (2021) http://minerals.usgs.gov/minerals/pubs/country/ USA US EPA (2016) Database of Sources of Environmental Releases of Dioxin like Compounds in U.S http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=20797 p 1-38, 6-9, USA

Polysafe Standard PUR and

Compliant to ISO 14025

Polysafe Vogue Ultra PUR Heterogeneous Flooring

14. Reviewers Report Conclusions

The independent LCA reviewer's report confirmed that the LCA project report and addition information addressed the EPD. The verifier was not involved in developing the LCA or EPD and has no conflict of interests from their organisational position.

While the report is confidential its conclusions confirmed that documentation according to set ISO Standard requirements was provided including evidence from the:

The Evah Institute, the LCA developer:

a) Recipes of input and output data of unit processes used for LCA calculations	\checkmark
b) Datasheets of measures, calculations, estimates and emails with sources as in Table a	
e) References to literature and databases from which data was extracted as noted in Table b	
g) Notes on supply chain processes and scenarios satisfying requirements of this Standard	
i) Embodied Energy shares as used for sensitivity analyses re ISO 14044:2006, 4.5.3.3	
j) Proof percentages or figures in calculations in the end-of-life scenario	
k) Notes on proof of % and allocation calculations	
o) All operations covered Vs criteria and substantiation used to determine system boundaries	\checkmark

Product Manufacturer in:

c) Specifications used to create the manufacturer's product	
d) Citations, references, specifications or regulations & data showing completeness	
f) Specification demonstrating that the building product can fulfil the intended use	

The Certifier Global GreenTag on:

I) Notes and calculation of averages of different locations yielding generic data	
m) Substantiating additional environmental information ISO 14025:2006, 7.2.4	\checkmark
n) Procedures for data collection, questionnaires, instructions, confidentiality deeds	

Requiring No Evidence:

As the EPD is cradle to grave as well as PCR compliant the independent reviewer did not need to):
h) Substantiate a few stages as all stages were substantiated	
p) Substantiate alternatives when no other choices and assumptions were applied	
q) Demonstrate consistency for few stages as the same rules in Tables 5 and 6 applied to all.	\checkmark



Polysafe Standard PUR and Polysafe Vogue Ultra PUR Heterogeneous Flooring

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Further and explanatory information is found at

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