Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Durasein® Solid Surface

from

GUANGDONG RELANG NEW MATERIAL TECHNOLOGY CO., LTD

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-07415
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019: 14 CONSTRUCTION PRODUCTS, version 1.2.5
PCR review was conducted by: The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com. The review panel may be contacted via info@environdec.com Chair of the PCR review: Claudia A. Peña, DDERE Research & Technology
Life Cycle Assessment (LCA)
LCA accountability: Lillian Li (Lillian.li@sgs.com) SGS-CSTC Standards Technical Services Co., Ltd.
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: Bill Kung(bill.k@1mi1.cn) Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Key environmental parameters

Parameters	Amount (Declared Unit: m^3)
GWP-total [kg CO2 eq.]	5.78 E+03
Primary energy demand [MJ]	1.80 E+05
Post-consumer recycled content percentage [%]	0

Product photos




Company information

Owner of the EPD:
GUANGDONG RELANG NEW MATERIAL TECHNOLOGY CO., LTD

Contact:
Shaofei Yang(yangshaofei@relangtech.com)

Description of the organisation and brand:

Guangdong RELANG New Material Technology Co., Ltd. was established in 1999. At Guangdong RELANG New Material Technology Co., Ltd. we make industry leading Durasein® solid surface for people with big, bendy, twisty ideas. But we are really in the business of making the wildest creative dreams of designers come true. At Guangdong RELANG New Material Technology Co., Ltd., we know our material inside and out, providing exceptional support from R&D through production and installation- we help push and set the standard for Solid Surface. Our sheets and shapes have inspired some of the most prominent creative firms in the industry and have been fashioned by top-notch fabricators in more than 55 countries on 6 continents. We are here to help our customers achieve anything they can imagine. So go ahead and dream, and see what we can do for you.

Pictures: factory building of Guangdong RELANG New Material Technology Co., Ltd.

Product-related or management system-related certifications:
Guangdong Relang New Material Technology Co., Ltd.- Management system-related certifications:
ISO 9001:2015 Quality management systems
ISO 14001:2015 Environmental management systems
ISO 45001:2018 Occupational health and safety management system

Durasein® conforms to the following technical specifications for solid surface:
ISFA-2-01 (2013) Classification and standards for solid surfacing materials
ISFA-2-02 (2013) Fabrication standards for solid surfacing material
ISO 19712-1 Classification and specification of solid surface
ISO 19712-2 Classification and specification of sheets
GB/T 40426.1-2021 Plastics-Decorative solid surfacing materials- Part 1: Classification and specifications
GB/T 40426.2-2021 Plastics-Decorative solid surfacing materials- Part 2: Determination of properties-Sheet solid surfacing material
JC/T 908-2013 Artificial stone
89/106/EEC CONSTRUCTION PRODUCTS DIRECTIVE
CSA B45.5-22/IAPMO Z124-2022 Plastic Plumbing Fixtures
EN 13310 Kitchen sinks. Functional requirements and test methods
EN 14688 Sanitary appliances-Wash Basins- Functional requirements and test methods
EN 14516 Baths for domestic purposes
EN 14527 Shower trays for domestic purposes
NSF/ANSI 51- Food equipment materials

Name and location of production site(s):
Name: GUANGDONG RELANG NEW MATERIAL TECHNOLOGY CO., LTD
Location: No 13, Hualian Third Road of Fine Chemical Engineering Zone, Gaolangang Economic Development Zone, Jinwan District, Zhuhai City, China

Product information

Product name: Durasein® Solid Surface

Product identification:

The physical characteristics of Durasein® Solid Surface can be found as following:

Characteristic	Nominal Value	Unit
Primary material thickness	4–25 (0.157–0.984)	mm (inch)
Sheet length	2440–3660 (96–144)	mm (inch)
Sheet width	760–1520 (30–60)	mm (inch)
Primary material weight	12.8–69.5 (28–153)	kg (lbs.)
Underlayment included	None	-
Underlayment type	None	-
VOC emissions test methods	UL 2818 – 2013 Gold Standard for Chemical Emissions for Building Materials, Finishes and Furnishings Building products and interior finishes compliant in accordance with California Department of Public Health (CDPH) Standard Method V 1.2-2017 using an Office and Classroom Environment. Product tested in accordance with UL 2821 test method to show compliance to emission limits on UL 2818. Section 7.1 and 7.2.	
Other characteristics	GREENGUARD and GREENGUARD GOLD certification ANSI/NSF-51 Food Equipment Materials certification	

Product description:

Durasein® solid surface is a nonporous, homogeneous surfacing material and is composed of approximately two-thirds natural minerals (ATH- alumina trihydrate, aluminum hydroxide) and one-third high strength resin (Polymethylmethacrylate or PMMA). Durasein®, a high-performance material, has a pleasant, warm to the touch characteristic similar to that of natural stone. Durasein® is chemical resistant, stain resistant, heat resistant and easy to clean, requiring minimal maintenance. Durasein® is available in a wide range of colors with outstanding aesthetics. Durasein® is available in many thicknesses (4 mm, 6 mm, 9 mm, 12 mm, 19 mm and 25 mm) and can be fabricated with standard woodworking tools. Sheets can be spliced together using color-coordinated adhesives giving virtually inconspicuous seams. Sheet material may be thermoformed allowing fabrication of endless designs having curved sections. Durasein® is available not only as sheets but also shapes, e.g., sinks, shower trays and bathtubs. Durasein® Solid Surface warrants to the original residential and/or commercial purchaser of our solid surface materials to be free of manufacturing defects for a period of 10 years starting from the date of installation. Durasein® solid surfaces must be fabricated and installed in accordance with the “Durasein® Fabrication and Installation” guidelines.

Durasein® solid surface material is used in furniture applications, cabinetry, countertops, interior columns, nurses’ stations for healthcare, reception desks and decorative wall designs in Hospitality, as well as other indoor applications stairs, railings and other design applications. Durasein® recommended colors have been used in outdoor applications such as signage, wall decorations, and benches. Durasein® solid surface has been classified as Class A in accordance with NFPA 101® and Life Safety Code® requirements. Durasein® is classified Euroclass B-s1 d0 according to EN 13501-1: 2003.

Durasein® sustainability report highlights that Durasein® protects the health of people and the planet through collaborative actions. More than 200 tons of pre-consumer acrylic resin waste materials from the manufacture of products are repurposed into other Durasein® products annually; 100% of process wastewater is filtered, reclaimed, and recycled; and 1600kw clean energy sourced from photovoltaic panels on the roof powers its manufacturing facility. Durasein® is engineered to help maintain a safer environment for human health from air quality to food safety. Durasein® does not have Crystalline Silica as an ingredient. Durasein® is formaldehyde free, has low volatile organic compound (VOC) emissions, is free of nanoparticles, and is Certified by NSF to the strictest level, Food Zone, for all food types.

The following Table 1 lists independent test report results for Durasein® Solid Surface. Additional information on Durasein® performance properties can be found at https://durasein.com/.

Table 1 Durasein® Technical Characteristics

Property	Test Method	Typical Result (nominal 12mm)
Density	ASTM D792 (ISO 1183)	1.73 g/cm3
Linear Thermal Expansion	ASTM D696 (ISO 11359-2)	3.5 x 10-5 m/m ℃ (2.1 x 10-5 in/in ℉)
Impact Strength (Gardner Impact)	ASTM D5420	803 mm (31.6 in) Mean Failure Height 28 J Mean Failure Energy
IZOD Notched Impact Strength	ASTM D256	2 J/m
Hardness, Rockwell “M” Scale	ASTM D785	>85
Hardness, Barcol Impressor	ASTM D2583 (ISO 19712-2)	67
Flexural Modulus	ASTM D790 (ISO 178)	1.4 x 106 psi (9887 Mpa)
Flexural Strength	ASTM D790 (ISO 178)	10,100 psi (69.6 Mpa)
Tensile Strength	ASTM D638 (ISO 527-2)	45.9 Mpa (6657 psi)
Tensile Elongation at Break	ASTM D638 (ISO 527-2)	0.50%
Tensile Modulus	ASTM D638 (ISO 527-2)	9890 Mpa (1.4 x 106 psi)
Colourfastness	CSA B45.5-22/IAPMO Z124-2022	PASS
Stain Resistance	CSA B45.5-22/IAPMO Z124-2022	PASS
Chemical Resistance	CSA B45.5-22/IAPMO Z124-2022	PASS
Cleanability & Wear	CSA B45.5-22/IAPMO Z124-2022	PASS
Cigarette Test	CSA B45.5-22/IAPMO Z124-2022	PASS
Ignitability Test	CSA B45.5-22/IAPMO Z124-2022	PASS
Water Resistance	CSA B45.5-22/IAPMO Z124-2022	PASS
Fungal Resistance	ASTM G21	ASTM Rating of 0, no observed growth on product at 100x power.
Bacterial Resistance	ASTM G22	No observed growth on product at 100x power
Flammability	NFPA 101®, Life Safety Code®	Class A
Flame Spread Index (FSI)	ASTM E84, NFPA 255, & UL 723	<25
Smoke Developed Index (SDI)	ASTM E84, NFPA 255, & UL 723	<25
Fire Classification of building materials (EU-Europe)	Class B-s1, d0	EN-13501
Food Zone	ANSI/NSF 51	NSF Certified for Food Zone (All Colors)

Geographical scope:

Modules A1-A3: China

Modules A4: Global

Modules C: Global

Modules D: Global

LCA information

Declared unit:

In accordance with the requirements of PCR, the declared unit is 1 cubic meter (m^3) of 12-mm thick solid surface sheet for a period of 10 years.

To convert volume to mass, multiply the volume by the density of the substance. The conversion factor of volume to mass in the LCA study is 1770kg/m^3.

Reference service life:

The warranty life of 10 years is used as the reference service life.

Time representativeness:

Data collection is in year of 2022, all used background datasets are valid for the entirety of 2022.

Database(s) and LCA software used:

Software: One-Metric&Simapro

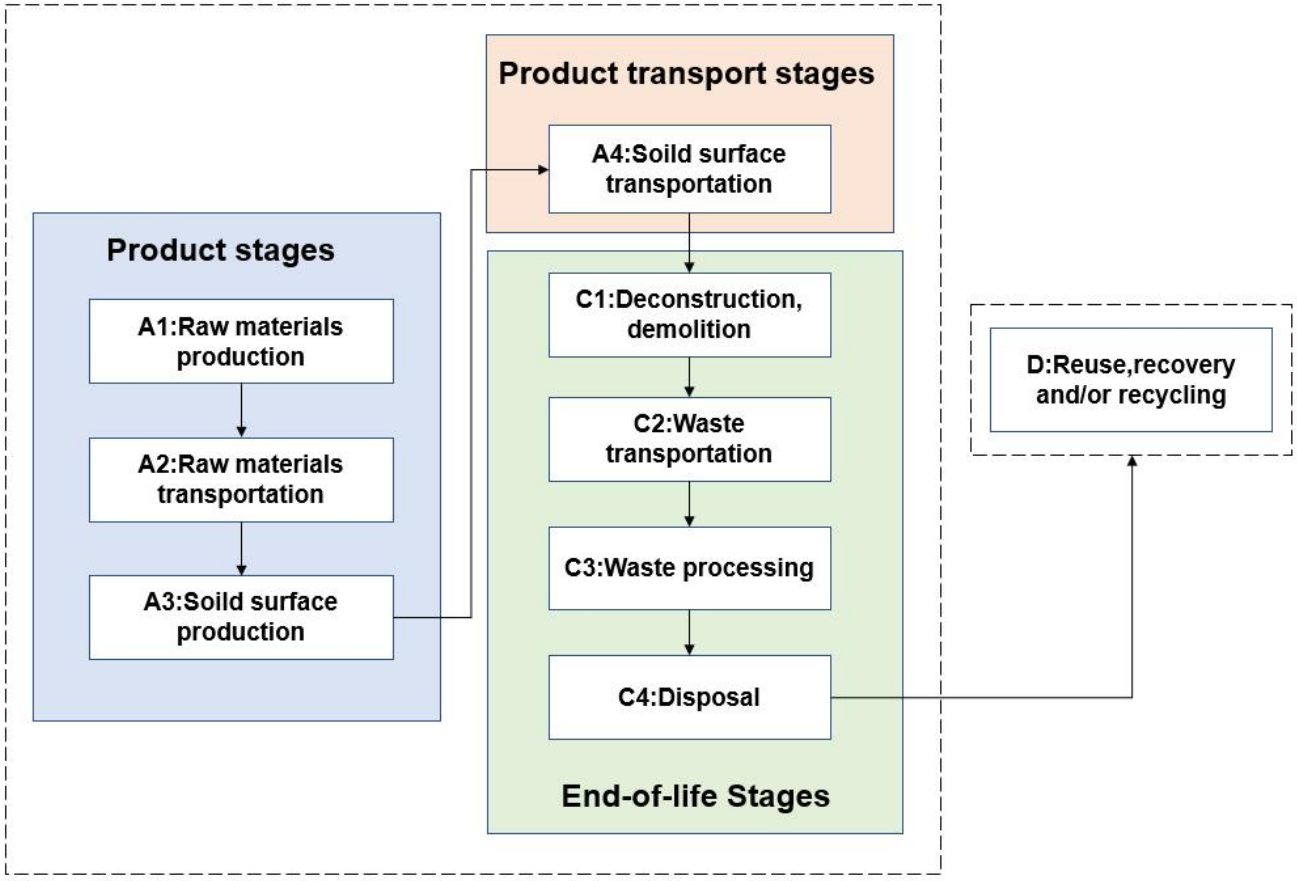
Database: Ecoinvent 3.8; 1mi1-CN

Description of system boundaries:

b) Cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A3 + C + D and additional modules).

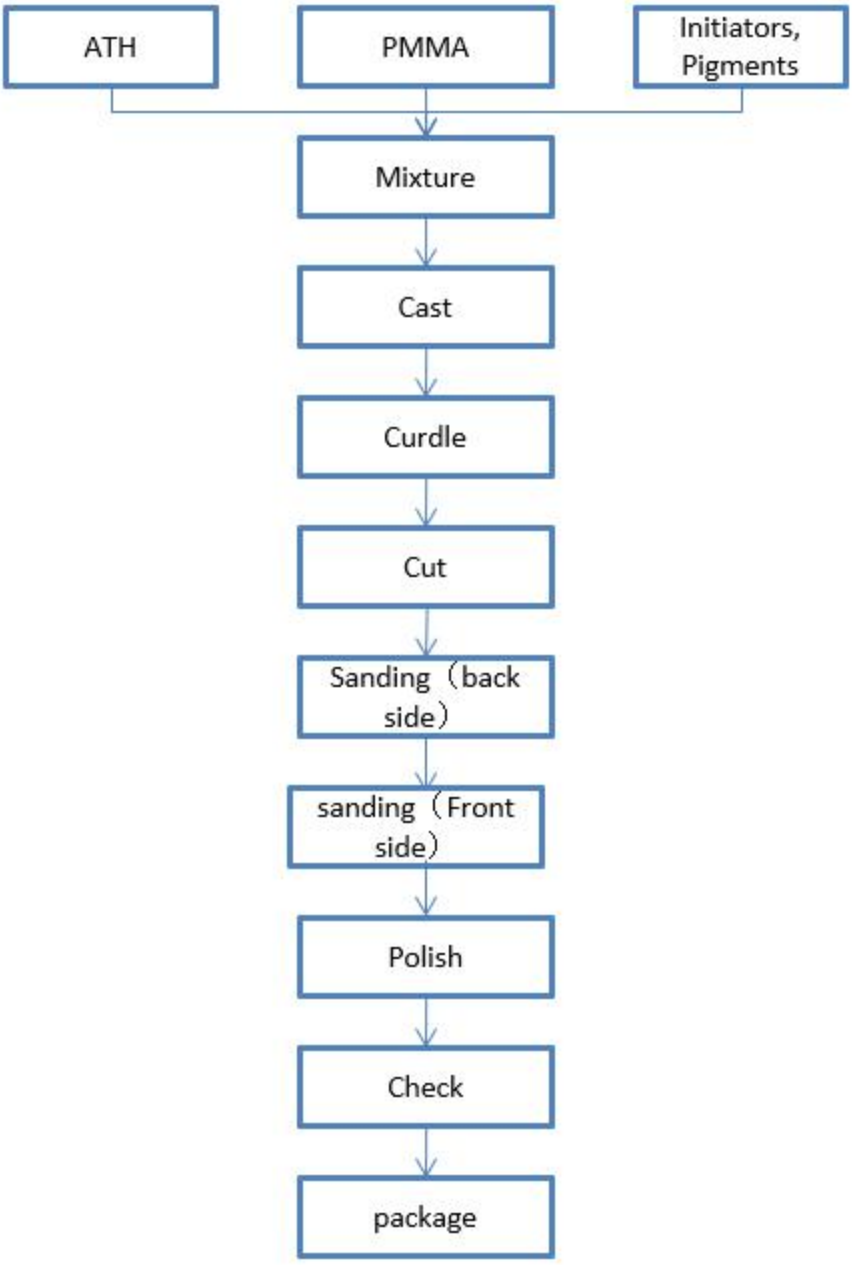
The system boundary of Durasein® solid surface products is A1-A3+A4+C+D.

System diagram:



Production flow chart:

Durasein® solid surface is produced through the following process: raw material - mixing - pouring - curing - cutting - grinding - cleaning - inspection - packaging. The raw materials are mainly aluminum hydroxide powder, PMMA resin, titanium dioxide paste and other pigments.The packaging materials are mainly corrugated paper and PET film. The energy consumption of the production process is low-voltage electricity (from China Southern Power Grid), the material consumption includes water for cleaning, and the emission includes volatile gases of organic materials.



More information:
Relevant assumptions in LCA:

1. Due to lack of transportation data for materials and products, the transportation data is based on background data, unified assumptions: road transportion uses freight lorry, Euro IV emission standards, 16-32 metric tons; freight ships are used for sea transport; rail transportation uses freight electric trains;
2. Due to the lack of transportation information at the end-of-life stage, it is assumed that the terminal waste transportation method is freight lorry (16-32 metric tons, Euro IV emission standard), and the transportation distance from user to treatment facilities is 100km.
3. At the end-of-life stage, the product disassembly consumes 10kWh/m^3; After dismantling, it is transported to the landfill plant, and the waste treatment process has no energy consumption, material consumption and emissions.
4. Due to the lack of disposal information at the end of the product life cycle, this study assumes that the waste is treated in solid waste landfill based on the current technology, and the landfill rate is 100%.
5. Since the landfill rate is assumed to be 100% at the end-of-life stage, a sensitivity analysis is required, and in the sensitivity analysis, it is assumed that 5% of the waste material is recovered and can replace aluminum hydroxide, titanium dioxide and other pigment raw materials.
6. The density of wood used in wooden pallets is assumed to be 900kg/m^3, that is, 74.3kg is equivalent to 0.08m^3.

Allocation:
Allocation refers to the partitioning of input or output flows of a process or a product system between the product systems under study and one or more other product systems. In this LCA, there are three types of allocation procedures considered:

Multi-input processes
For data sets in this LCA, the allocation of the inputs from coupled processes is generally carried out via the mass. The consumption of raw materials is allocated by mass ratio. The transportation of raw materials is allocated by mass ratio.

Multi-output processes
In the production of Durasein® Solid Surface, the total consumption of energy during manufacturing is equally allocated per unit quantity. No other by-products are produced from the production, hence there is no production of by-products that need to be used to allocate the situation.

Allocation for recovery processes
For the allocation of residuals, the model “allocation cut-off by classification (ISO standard) (called “Allocation Recycled Content”, alloc rec, by Ecoinvent) is used. The underlying philosophy of this approach is that primary (first) production of materials is always allocated to the primary user of a material. If material is recycled, the primary producer does not receive any credit for the provision of any recyclable materials. Consequently, recyclable materials are available burden-free for recycling processes, and secondary (recycled) materials bear only the impacts of the recycling processes.

As for the end-of-life stage of Durasein® Solid Surface, following the PCR’s recommendation on end-of-life scenario of reuse, recycling, and recovery, taking into account the transport of waste product as well as the final disposal of the waste. Along with the benefit, the load from waste treatment for recycling purposes such as de-pollution and crushing, etc., is also allocated to the next life cycle of substituted products, but not the primary producers, hence no burden or benefit will be allocated to the primary producer of the Durasein® Solid Surface (cut-off approach).

Cut-off rules:

1. This LCA has collected data for all unit inputs and outputs, including assumptions about missing data.
2. The proportion of the following raw materials is less than 1%, according to PCR requirements, this data can be discarded.

Material	Weight/ kg/DU	Percentage
Organic additives	12.39	0.7%

Data quality:

Steps were taken to ensure that the LCI data were reliable and representative. The type of data that was used is clearly stated in the Inventory analysis, be it measured or calculated from primary sources or whether data are from the LCI databases. In this study, the data quality requirements were as follows:

- specific data of the considered system (such materials or energy flows that enter the production system). These data were calculated and submitted by manufacturer.
- generic data related to the life cycle impacts of the material or energy flows that enter the production system. These data were sourced from the databases in SimaPro and One-Metric (1mi1) platform.
- existing LCI data were, at most, 10 years old. Newly collected LCI data were current or up to 3 years old;
- the LCI data related to the geographical locations where the processes occurred;
- the technology represented the average technologies at the time of data collection.

SimaPro is one of the world's most widely used LCA software and the data in it comes predominantly from Ecoinvent, the world's most complete and widely used set of data on industrial processes, material production, packaging production, transport, and so on. The One-metric (1mi1) platform (http://www.1mi1.org) includes basic LCA， carbon footprint and eco-design functions, besides, it is also compatible with the latest global ecological footprint and carbon footprint assessment methods, IPCC2013, CML2013, Recipe, EPD and other midpoint and endpoint LCA evaluation methods, compatible with international database such as Ecoinvent etc. One-metric platform is also the developer of the 1mi1 professional database in China.

Table 2 Date quality requirement

Quality requirement	**Specific requirement**	**Data quality**	**Result good / fair / poor**
Time-related coverage (age of data and the minimum length of time over which data should be collected)	Existing LCI data were, at most, 10 years old.	<10 years	good
	Newly collected LCI data were current or up to 3 years old	Durasein® Solid Surface 2022 production inventory	good
Geographical coverage (the geographical area from which data for unit processes should be collected to satisfy the goal of the study):	Unit process for raw materials should be collected directly from manufacturers or use generic data	All raw material data was collected from the manufacturer in China	good
	Unit process for the Durasein® Solid Surface should represent the real site	Data provided by Durasein® Solid Surface was collected	good
	End-of-life disposal of Durasein® Solid Surface should represent the region of disposal	The actual level of waste material recycling rate, generic data from database was used for scenario development	fair
Transportation and energy data	Transportation and energy data should represent the region	Transportation and energy use Ecoinvent data and	good

Quality requirement	Specific requirement	Data quality	Result good / fair / poor
		one-metric china database	
Technology coverage (specific technology or technology mix):	Specific technology for Durasein® Solid Surface should be represented in the analysis	For Durasein® Solid Surface crafts as well as raw material manufacturing, the technology is the most recent;	good
Precision (a measure of the variability of the data values for each data expressed, e.g. variance):	Data for Durasein® Solid Surface manufacturing should be directly measured	Data for Durasein® Solid Surface manufacturing was collected from the measured or calculated value	fair to good
Completeness	99% of flow is measured or estimated	All of the unit process within the scope of the life cycle were included, with less than 1% cut off	good
Representativeness	Qualitative assessment of the degree to which the data set reflects the true population of interest, i.e. geographical coverage, period, and technology coverage	See geographical coverage, period, and technology coverage requirement above, all meet	good
Consistency	Qualitative assessment of whether the study methodology is applied uniformly to the various components of the analysis	The study methodology is applied uniformly to the various components of the analysis	good
Reproducibility	Qualitative assessment of the extent to which information about the methodology and data values would allow an independent practitioner to reproduce the results reported in the study	Yes	good
Sources of the data	The foreground data of Durasein® Solid Surface manufacturing should be from the primary producer	Yes	good
Uncertainty of the information	Data, models, and assumptions should be verified	All the primary data and assumptions were confirmed with Durasein® Solid Surface, and models were built following ISO 14040/44 and PCR requirements	good

Electricity mix:

In this LCA study, Southern China grid electricity mix is used. The production of Durasein® Solid Surface takes place in Zhuhai, Guangdong province. The GWP result of low-voltage electricity in China Southern Power Grid is 0.428kg CO_2 eq/kWh. The data comes from one-Metric (1mi1) local database in China.

Sensitivity analysis:

To analyze the robustness of the result from various assumptions in the LCA study, including waste transportation distance and waste landfill rate, a sensitivity is necessary to be carried.

The sensitivity analysis results showed that when the distance of waste transportation increased to twice (200km), the change rates of ODP and GWP-luluc were 3.50% and 2.58%, and the change rates of other environmental impact indicators were lower than 2%. When the distance of waste transportation increased to 4 times (400km), the change rates of ODP and GWP-luluc were 10.50% and 8.25%, and the other environmental impact indicators were lower than 4%. After the scenario sensitivity analysis of 95% landfill rate, the change of environmental impact indicators was within 1%. In the future, continuous updating of models and data will have different results. In order to maintain the accuracy and reliability of LCA results, it is necessary to continuously update the latest data.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	CN	CN	CN	GLO	ND	ND	ND	ND	ND	ND	ND	ND	GLO	GLO	GLO	GLO	GLO
Specific data used	＞90%			＞90%	-	-	-	-	-	-	-	-	0%	0%	0%	0%	0%
Variation – products	0%			0%	-	-	-	-	-	-	-	-	0%	0%	0%	0%	0%
Variation – sites	0%			0%	-	-	-	-	-	-	-	-	0%	0%	0%	0%	0%

Content information

Information on the use of raw materials and packaging materials

Product components	Weight, kg/DU	Post-consumer material, weight-%/DU	Biogenic material, weight-% and kg C/DU
Titanium dioxide	23.01	0	-
Aluminum hydroxide	1132.8	0	-
Polymethyl methacrylate (PMMA)	601.8	0	-
TOTAL	1757.61	0	-
Packaging materials	**Weight, kg/DU**	**Weight-% (versus the product)/DU**	**Weight biogenic carbon, kg C/DU**
Corrugated paper	2	0.11%	0.13
PET	6.3	0.36%	0
Wooden pallet	74.3	4.23%	28.67
TOTAL	82.6	4.70%	28.80

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
No SVHC in product			

Transportation information for raw materials and packaging materials

For road transport, uniform assumptions: freight lorry, 16-32 metric tons, Euro IV emission standards. For the transportation of aluminum hydroxide, it is transported by railway from the supplier to Rizhao Port, then transported by freighter to Zhuhai Port, and finally transported by lorry to the production plant.

Name	Supplier address	Transportation way	Transportation distance/km
Titanium dioxide	Foshan City, Guangdong Province, China	Road	110
Aluminum hydroxide	Jiaozuo City, Henan Province, China	Railway	600
Aluminum hydroxide	Jiaozuo City, Henan Province, China	Marine	2222.4
Aluminum hydroxide	Jiaozuo City, Henan Province, China	Road	60
Methyl methacrylate (MMA)	Huizhou City, Guangdong Province, China	Road	280
Corrugated paper	Zhuhai City, Guangdong Province, China	Road	13

PET	Zhuhai City, Guangdong Province, China	Road	35
Wooden pallet	Zhuhai City, Guangdong Province, China	Road	41

Product production information

The following table shows the data information for each declared unit of product in the production process. In the production process, 284.53kg of corner waste is generated per unit of product, of which 230kg is reused to continue to produce solid surface, and 54.53kg is processed by recycler. The recycler is located in Foshan City, Guangdong Province, 130km away from the production plant.

Energy consumption	Quantity	Unit
Low-voltage electricity(molding)	130	kWh
Low-voltage electricity(cutting)	5	kWh
Low-voltage electricity(grinding)	116	kWh
Low-voltage electricity(post-processing)	60	kWh
Steam	100	kg
Material consumption	**Quantity**	**Unit**
Water	0.05	kg
Emission	**Quantity**	**Unit**
NMVOC	0.038	kg

Product transportation information

According to the following sales information, product transportation is divided into domestic transportation and foreign transportation, of which domestic transportation accounts for 26.92%, the mode of transportation is freight trucks, 16-32 metric tons, Euro IV emission standards, foreign transportation accounts for 73.08%, and the mode of transportation is sea freighters. The product density is 1750kg±50kg/m^3, and the relevant calculation is carried out according to 1750kg/m^3.

Country	City	Percentage	Transportation way	Transportation distance/km
China	WUHAN	26.92%	Road	1200.00
Italy	GENOVA	0.06%~28.08%	Marine	14780.00
India	CHENNAI			7800.00
United Kingdom	SOUTHAMPTON			17868.08
Brazil	SANTOS			11766.48

Saudi Arabia	RIYADH			10300.00
Denmark	AARHUS			19581.14
Greece	THESSALONIKI			13850.79
Thailand	BANGKOK			3002.08
Morocco	CASABLANCA			16090.16
New Zealand	AUCKLAND			9639.64
Uruguay	MONTEVIDEO			27096.60
South Africa	CAPE TOWN			13302.90
Cyprus	LIMASSOL			12573.21
United States	CHARLESTON			20504.00
Guatemala	PUERTO QUETZAL			14774.00
Spain	BARCELONA			15138.23
Australia	BRISBANE			8000.00
Singapore	SINGAPORE			2952.44
Philippines	CEBU			2042.74

Product end-of-life information

Waste corrugated cardboard: incineration, PET film: sanitary landfill. See key assumptions for product-related end-of-life treatment.

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per declared unit								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	5.61E+03	2.94E+02	8.86E+00	3.14E+01	0.00E+00	2.15E+01	0.00E+00
GWP-biogenic	kg CO_2 eq.	-1.01E+02	-4.69E-01	-6.56E-02	-4.28E-02	0.00E+00	1.12E+02	0.00E+00
GWP-luluc	kg CO_2 eq.	1.33E-01	5.20E-02	2.02E-04	5.64E-03	0.00E+00	3.08E-03	0.00E+00
GWP-total	kg CO_2 eq.	5.51E+03	2.94E+02	8.79E+00	3.14E+01	0.00E+00	1.33E+02	0.00E+00
ODP	kg CFC 11 eq.	1.30E-04	5.73E-05	7.79E-08	7.01E-06	0.00E+00	5.97E-06	0.00E+00
AP	mol H^+ eq.	3.60E+01	5.33E+00	5.42E-02	1.63E-01	0.00E+00	1.85E-01	0.00E+00
EP-freshwater	kg P eq.	5.74E-01	1.23E-02	1.13E-03	1.43E-03	0.00E+00	4.76E-03	0.00E+00
EP-marine	kg N eq.	5.93E+00	1.11E+00	9.11E-03	5.33E-02	0.00E+00	7.59E-02	0.00E+00
EP-terrestrial	mol N eq.	4.91E+01	1.24E+01	9.76E-02	5.84E-01	0.00E+00	6.67E-01	0.00E+00
POCP	kg NMVOC eq.	2.10E+01	3.32E+00	2.59E-02	1.66E-01	0.00E+00	1.91E-01	0.00E+00
ADP-minerals &metals*	kg Sb eq.	7.31E-03	3.02E-04	5.89E-06	8.29E-05	0.00E+00	2.80E-05	0.00E+00
ADP-fossil*	MJ	7.98E+04	3.95E+03	7.05E+01	4.59E+02	0.00E+00	4.48E+02	0.00E+00
WDP*	m^3	1.06E+03	2.06E+01	3.75E-01	2.64E+00	0.00E+00	1.92E+01	0.00E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption							

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks*

Additional mandatory and voluntary impact category indicators

Results per declared unit								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	5.61E+03	2.94E+02	8.86E+00	3.14E+01	0.00E+00	2.15E+01	0.00E+00

Resource use indicators

Results per declared unit								
Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2.67E+03	7.72E+01	1.12E+01	5.58E+00	0.00E+00	1.39E+01	0.00E+00
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	2.67E+03	7.72E+01	1.12E+01	5.58E+00	0.00E+00	1.39E+01	0.00E+00
PENRE	MJ	8.49E+04	4.07E+03	1.11E+02	4.59E+02	0.00E+00	4.59E+02	0.00E+00
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	8.49E+04	4.07E+03	1.11E+02	4.59E+02	0.00E+00	4.59E+02	0.00E+00
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	2.47E+01	4.82E-01	8.75E-03	6.25E-02	0.00E+00	4.46E-01	0.00E+00
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water							

Waste indicators

Indicator	**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.85E+03	0.00E+00
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Output flow indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	5.45E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported thermal energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Differences versus previous versions

Editorial update: delete words of bacteristactic and antibacterial in the product description section as USA EPA FIFRA regulations require testing data for use of these two words (updated on 8th Sep 2023).
Add the conversion factor to mass in the declared unit (updated on 8th Sep 2023).

References

Durasein® Solid Surface LCA Report.

Durasein® Greenguide.

EN 15804: Sustainability of construction works- Environmental product declarations- Core rules for the product category of construction products.

General Programme Instructions of the International EPD® System. Version 4.0.

ISO 14025: Environmental labels and declarations- Type III environmental declarations- Principles and procedures.

ISO 14040: Environmental Management- Life cycle assessment- Principles and Framework.

ISO 14044: Environmental Management- Life cycle assessment- Requirements and Guidelines.

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