Environmental Product Declaration

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

Stonblend HDF - Europe

from

Stonhard

Programme:	The International EPD® System, www.environdec.com
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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
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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 (EN 15804+A2) (1.3.2)*
PCR review was conducted by: IVL Swedish Environmental Research Institute, Secretariat of the International EPD System
Life Cycle Assessment (LCA)
LCA accountability: iPoint systems GmbH, Reutlingen, Germany and Rebecca Le Blanc, LCA Resource, Swampscott, MA, USA
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: **X** EPD verification by individual verifier Third-party verifier: Thomas Gloria, Industrial Ecology Consultants, LLC and signature of the third-party verifier Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes **X** 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.

Company information

Owner of the EPD: Stonhard
Contact: Chris Trageser, (856)-779-7500, 1000 East Park Ave, Maple Shade, NJ 08052
Description of the organisation: Stonhard is committed to manufacturing and installing quality, seamless products that protect, maintain and enhance industrial and commercial environments. We maintain a global leadership position in the marketplace with the support of those who stand behind the Stonhard name, and who passionately believe that success happens because of the people who make it happen.
Product-related or management system-related certifications: ISO 9001
Name and location of production site(s): Alghero, Sardina (Italy) and Nuremberg, Germany

Product information

Product name: Stonblend HDF
Product identification: Resinous Flooring
Product description: Stonblend HDF is a fluid applied flooring system which falls under the MasterFormat classification 09 67 00.00 Finishes: Fluid-Applied Flooring. It consists of 6-layers: a primer (Stonkote CE4), epoxy mortar (Stonblend HDF), a grout coat (Stonblend Groutcoat), an epoxy topcoat (Stonkote CE4) and two coats of a urethane matte topcoat (Stonseal CF7).

Individual component descriptions

Stonkote CE4 is a two-component, epoxy based priming and sealing product. It is applied to a properly prepared substrate prior to the application of the appropriate Stonhard overlayment. The use of Stonkote CE4 ensures a secure bond between the substrate and the overlayment, reduces absorption of the overlayment's liquids (epoxy resin/curing agent) and makes the application of the overlayment easier.
Stonblend HDF is a three-component, troweled, decorative epoxy mortar system. The system utilizes a colored quartz blended with an epoxy resin and amine curing agent. Stonblend HDF is applied at thickness of 3/16in/5mm. Stonblend HDF cures to an extremely hard, impact resistant surface which exhibits excellent abrasion, wear and chemical resistance.
Stonblend Groutcoat is a two-component, epoxy based sealing product. It is designed to seal off and fill in the porosity of a Stonblend mortar application prior to the additional sealer steps.
Stonkote CE4 is a two-component, epoxy based priming and sealing product. It is applied over a Stonblend mortar that has already received an application of Stonblend Groutcoat to provide additional sealing prior to the final sealers.
Stonseal CF7 is a two-component, water based aliphatic urethane coating. It is specifically formulated to provide outstanding protection from a wide range of chemicals while increasing abrasion resistance and cleanability. Stonseal CF7 provides a matte finish and two coats are required in the Stonblend HDF application.

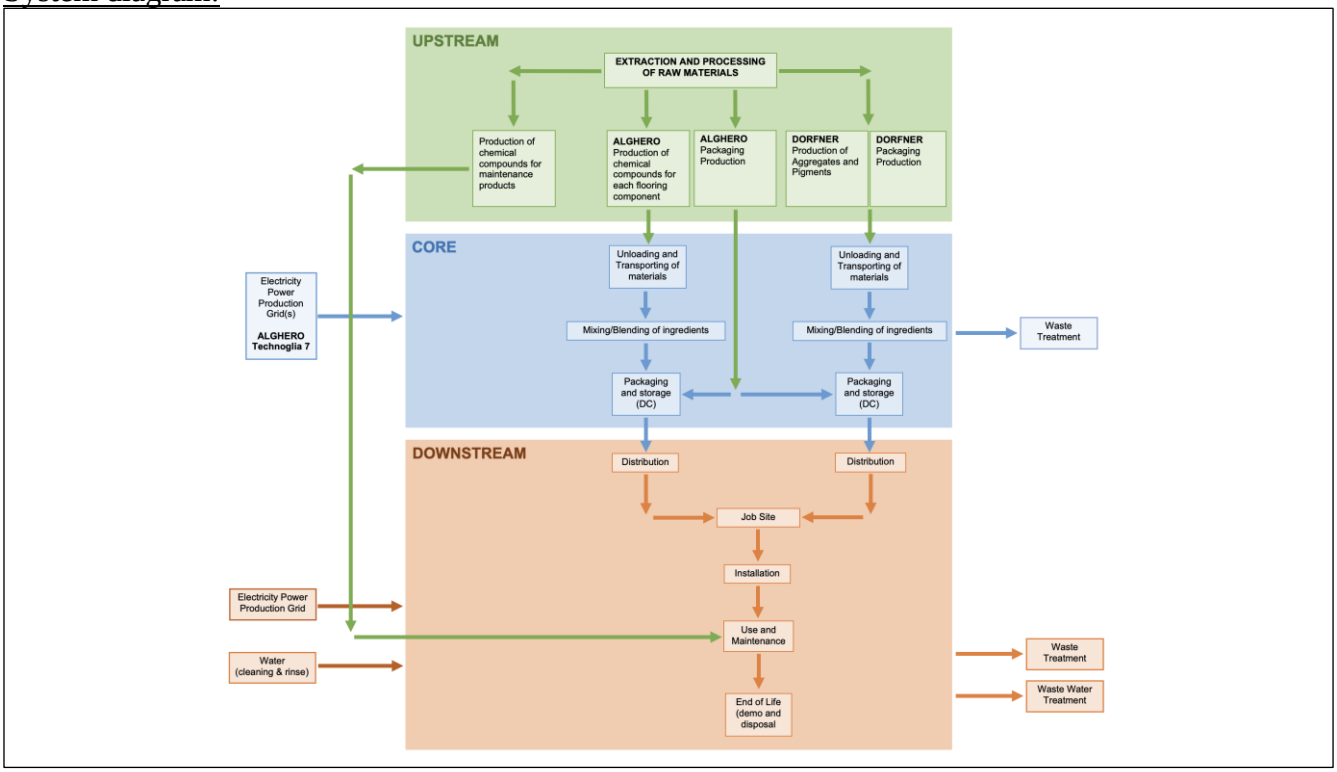
UN CPC code: 35110 Paints and Varnishes, non-refractory surface preparations for walls, floors and ceilings.
Geographical scope: The contents of this EPD encompass materials that will be produced for the majority of Europe.

LCA information

Functional unit / declared unit: 1m² of the flooring system
Time representativeness: 2022
Database(s) and LCA software used:
The LCA software Umberto 11 with the ecoinvent database EN15804 (version 3.9.1) was used.

Description of system boundaries:
e) Cradle to gate with options - the additional modules are A4 and A5. No biogenic carbon.

System diagram:



More information:

Assumptions
As there was no LCIA data available for the raw materials, the database ecoinvent 3.9.1 was used.
For some of the chemical materials which were not available in ecoinvent, a generic stoichiometric modelling was done based on the description in (Hischier, 2004). Here, an average energy consumption for the production of chemicals based on a typical production site (Gendorf Chemiepark, DE) is used in combination with the raw materials needed to produce this chemical based on the reaction equation.
Some chemicals for which either no production route could be found, or which are used in a low amount, generic datasets for “organic chemicals” or “inorganic chemicals” were used.

Electricity consumption
As the manufacturing floor is not separately metered, electricity consumption was calculated based on motor nameplate data and batch mixing times for each component for the following process steps:

- Receiving
- Mixing
- Packaging

The Italian production site in Alghero does not have a specific electricity mix with guaranteed electricity mix delivery so the Italian residual mix is used (GWP-GHG 0.62 kg CO_2e/kWh). At the German production site in Nuremberg, 40% of the electricity is produced in a self-owned CHP plant. This part of electricity consumption is modelled using an ecoinvent dataset for a natural gas heat and power cogeneration 400 MW plant in combination with a dataset for electricity voltage transformation from high to medium voltage (GWP-GHG 0.44 kg CO_2e/kWh). The remaining 60% is purchased from an electricity provider without a certificate for the renewable electricity share. So, here the German residual electricity mix is used (GWP-GHG 0.69 kg CO_2e/kWh).

Cut-off criteria
The cut-off criteria according to EN 15804 which requires a minimum of 95% of total inflows (mass and energy) are applied.
All raw materials which are needed to produce the flooring system are primary data from Stonhard and are included in the LCI based on the information given (100% mass inflows). Electricity consumption is determined based on the equipment involved in the production chain and on the installation sites. The transports are modelled supplier specific for the raw materials and production site specific for the components which are sent to the distribution centre in Nivelles, Belgium. The distribution of the components to the installation sites is based on sales data and average distances from the distribution centre to the capitals of the supplied countries. Waste rates are measured for the production phase and are estimated for the installation phase.
The only known cut-offs are

- waste which eventually occurs during transportation. To account for these losses, the liquid waste in the installation phase is calculated with 3% which is a higher end assumption.
- Ferry transport of the product to installation sites in Great Britain as the sales share is below 5% and the ferry distance is only 110 km.

Allocation
As there are no multi-output processes, no allocation rules had to be taken into account for the foreground processes. In ecoinvent background processes, the allocation, cut-off, EN15804 system model is used. This model follows the underlying principles of the cut-off approach of the EN15804 where producers of waste bear the burden of the waste treatment, based on the "polluter pays" principle, and consumers of recycled products receive them burden-free.

Inclusion or exclusion of infrastructure for upstream, core and downstream processes
Infrastructure is by default included in the mapped ecoinvent datasets. For the production at Stonhard itself there was no infrastructure considered as the influence of infrastructure for mechanical processing plants (mixing devices) can be omitted.

Scenarios of the declared modules A4 and A5

To account for deviations in the transport distances of module A4, scenarios with an adjusted transport distance of + 10% and -10% (compared to the reference transport distances) were considered.

Since the construction installation in module A5 has a subordinate impact on the results, no scenarios were considered.

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	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	IT, DE, BE, NL	EU	IT, DE	EUR	EUR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Specific data used	> 90%			30%	> 90%	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Variation – products	0%			0%	0%	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Variation – sites	0%			0%	0%	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Stonkote CE4	0.269	0	0 resp. 0
Stonblend HDF	8.333	0	0 resp. 0
Stonblend Groutcoat	0.180	0	0 resp. 0
Stonkote CE4	0.202	0	0 resp. 0
Stonseal CF7	0.269	0	0 resp. 0
TOTAL	9.253		
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
Carton Board	0.225	2.4	42.6 resp. 0.095
Plastics	0.111	1.2	0 resp. 0
TOTAL	0.336	3.6	

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
None			

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit				
Indicator	**Unit**	**A1-A3**	**A4**	**A5**
GWP-fossil	kg CO_2 eq.	10.23	2.43	0.44
GWP-biogenic	kg CO_2 eq.	-0.03	0.00	0.07
GWP-luluc	kg CO_2 eq.	0.01	0.00	0.00
GWP-total	kg CO_2 eq.	10.21	2.43	0.51
ODP	kg CFC 11 eq.	1.64E-05	0.00	0.00
AP	mol H^+ eq.	0.05	0.01	0.00
EP-freshwater	kg P eq.	2.73E-03	0.00	0.00
EP-marine	kg N eq.	9.89E-03	5.11E-03	1.98E-04
EP-terrestrial	mol N eq.	0.09	0.06	0.00
POCP	kg NMVOC eq.	0.04	0.02	0.00
ADP-minerals&metals*	kg Sb eq.	9.5E-05	0.00	0.00
ADP-fossil*	MJ	235.73	35.13	2.72
WDP*	m^3	6.43	0.17	0.08
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.*

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit				
Indicator	**Unit**	**A1-A3**	**A4**	**A5**
GWP-GHG[1]	kg CO_2 eq.	10.29	2.43	0.47
Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017		ND	ND	ND

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Resource use indicators

Results per functional or declared unit				
Indicator	**Unit**	**A1-A3**	**A4**	**A5**
PERE	MJ	10.72	0.54	0.43
PERM	MJ	0.00	0.00	0.00
PERT	MJ	10.72	0.54	0.43
PENRE	MJ	235.76	35.13	2.72
PENRM	MJ	78.34	0.00	0.00
PENRT	MJ	314.10	35.13	2.72
SM	kg	0.25	0.02	0.00
RSF	MJ	0.02	0.00	0.00
NRSF	MJ	0.00	0.00	0.00
FW	m3	0.16	0.00	0.00
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			

[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.

Waste indicators

Results per functional or declared unit				
Indicator	**Unit**	**A1-A3**	**A4**	**A5**
Hazardous waste disposed	kg	0.31	0.02	0.03
Non-hazardous waste disposed	kg	12.24	0.72	0.40
Radioactive waste disposed	kg	2.14E-04	0.00	0.00

Output flow indicators

Results per functional or declared unit				
Indicator	**Unit**	**A1-A3**	**A4**	**A5**
Components for re-use	kg	0.00	0.00	0.00
Material for recycling	kg	3.86E-02	3.81E-04	1.80E-04
Materials for energy recovery	kg	1.60E-04	1.59E-06	7.21E-08
Exported energy, electricity	MJ	0.13	5.62E-03	7.64E-03
Exported energy, thermal	MJ	4.53E-01	1.33E-02	8.64E-04

References

1. EPD International (2021) General Programme Instructions for the International EPD® System. Version 4.0.
2. The International EPD System PCR 2019:14 version 1.3.2 Construction products
3. EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
4. ISO 14025: environmental labels and declarations – type III Environmental Declarations - Principles and procedure (2009)
5. ISO 14040: Environmental management – Life Cycle Assessment – Principles and framework (2006)
6. ISO 14044: Environmental management – Life Cycle Assessment – Requirements and guidelines (2006)
7. ISO 14020:2000: Environmental labels and Declarations - General principles
8. (Hischier, 2004) Hischier, Roland; Hellweg, Stefanie; Capello, Christian; Primas, Alex (2004): Establishing Life Cycle Inventories of Chemicals Based on Differing Data Availability (1). Available online at https://link.springer.com/article/10.1065%2Flca2004.10.181.7

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