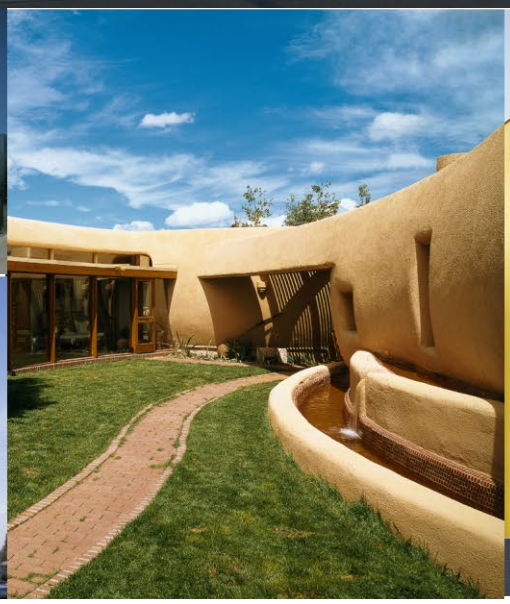
Building with conscience.

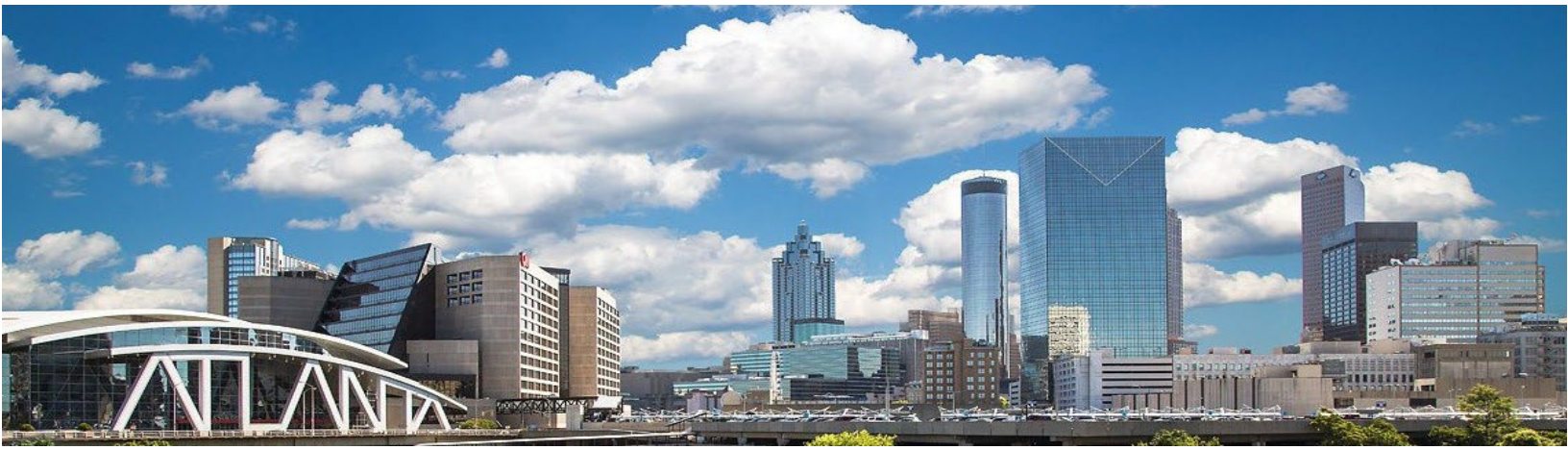
EPD for Sto RapidGuard®

Sto RapidGuard® is a single-component, multi-use air barrier and waterproofing material that seals rough openings , seams, sheathing joints, cracks, penetrations, and transitions in above-grade wall.



epstengroup Environmental Product Declaration

epstengroup Solutions for a Sustainable World



PCR Identification	PCR for Water-Resitive and Air Barriers on the basis of ISO 21930: 2017, ASTM 2017. Valid through Sept, 2022
PCR Review was conducted by	Thomas P. Gloria, Industrial Ecology Consultants. Graham Finch, RDH Building Science, Inc Paul H. Shipp, USG Corporation
Product Category	Air Barrier and Waterproofing Membrane
EPD Owner's name	Sto Corp. 3800 Camp Creek Parkway SW, Building 1400, Suite 120 Atlanta, GA 30331 www.stocorp.com | (800) 221-2397
EPD program operator	Epsten Group, a Salas O'Brien Company 101 Marietta St NW Suite 2600 Atlanta, GA 30303 www.epstengroup.com
Declaration Number	01-019
Date of Certification	October 9th, 2024
Period of Validity	5 years from date of certification
Declared Unit	One square meter of covered and protected substrate
Overall Data Quality Assessment Score	Good
Site(s) in which the results of the LCA are representative	Waconia, MN, USA
Information on where explanatory material can be obtained	See references at the end of this document.
LCA Software and Version Number	LCA for Experts (formerly GaBi) 10.7
LCI Database and Version Number	MLC (formerly GaBi) Database Version 2023.2
This declaration was independently verified in accordance with ISO 21930:2017, ISO 14025: 2006 and the reference PCR: PCR for Architectural Coatings: NAICS 325510 ☐ Internal ☒ External	Megan Blizzard Megan.Blizzard@salasobrien.com Megan Blizzard
This life cycle assessment was conducted in accordance with ISO21930:2017, ISO 14044 and the reference PCR by:	WAP Sustainability Consulting, LLC
This life cycle assessment was independently verified in accordance with ISO 21930:2017, ISO 14044 and the reference PCR by:	Angela Fisher, Aspire Sustainability angela@aspiresustainability.com Angela Fisher

Comparability

In order to support comparative assertions, this EPD meets all comparability requirements stated in ISO 14025:2006. However, differences in certain assumptions, data quality, and variability between LCA data sets may still exist. As such, caution should be exercised when evaluating EPDs from different manufacturers, as the EPD results may not be entirely comparable. Any EPD comparison must be carried out at the building level per ISO 21930 guidelines. The results of this EPD reflect an average performance by the product and its actual impacts may vary on a case-to-case basis.

Company

We believe in '**Building with conscience**'.

That means ensuring that all building products are not only safe, effective and easy to install, but also environmentally responsible and sustainable. We know you're always looking for the smartest and newest technology to create energy efficient buildings with superior aesthetics.

That's exactly what our products help you achieve. Products like our wall systems, coatings and finishes are consistent favorites among design professionals, contractors and property owners alike. Whatever your needs or vision may be, we offer products for every type of building project; whether it's new construction, restoration or panelization, commercial or residential work.

An architect or specifier focuses on aesthetics and feasibility, a contractor needs products that are easy to work with, and a building owner requires high value and low costs on properties. Sto understands these unique needs, and delivers the smart, innovative materials and solutions that make this all possible. That's why Sto remains the innovative leader in integrated exterior wall systems.

When you combine that commitment to product support and innovation with value-added offerings like consultative design and color services through Sto Studio or training in proper application techniques through the Sto Institute, you get an integrated exterior wall system solution unmatched in the industry.

Manufacturing Sites Covered in this EPD

The manufacturing location is Waconia, Minnesota, USA

Product Identification

Sto RapidGuard® is a moisture-cured, damp surface tolerant Sto-Guard Detail Component. Using, Silyl-Terminated Polyether (STPE) polymer, it is ideally suited for sealing sheathing joints and complex shapes such as penetrations and protruding/recessed window bucks.

Table 1: Product Identification

Product Name	Product Number
Sto RapidGuard®	81571

Performance Features

Waterproof Material	No mesh/fabric/tapes needed at rough openings and sheathing joints	Cures in wet weather and on damp substrates
Vapor Permeable	Fast Cure	Gun Applied

Technical Details

Performance*	Test Method	Result	Unit
Air Permeance	ASTM E2718	<0.02	L/m^2*s @ 75 Pa
Water Vapor Permeance	ASTM E96	6.18 5.37	perms @ 20 mils perms @ 30 mils
Water Penetration	ASTM E2570/AATCC 127 (modified)	No water penetration for 5 hour water column (55 cm)	

Because this product can serve several functions and is an individual component intended for use in Sto's wall systems, not all technical properties specified by the PCR for individual components apply. The technical properties and product performance criteria depend on the combination of products in the wall system. As such, the following table declares the product performance when used in Sto wall systems.

Table 2: Technical Data for Product as a Component of Sto Wall Systems

Meets Requirements of	ASTM Classification	Evaluation Criteria:	Evaluation Report Reference
2021 IBC,IRC and IECC	ASTM E2570 / ASTM E2568	ICC AC 212	ESR 1233

Material Composition

The material compositions of Sto RapidGuard® are listed below:

Table 3: Material composition for Sto RapidGuard®

	Sto RapidGuard®
Polyether Polyol	45%
Mineral Fillers*	48%
Colorant	5%
Additive**	2%

*Mineral fillers include limestone, dolomite, etc.
**Additives include light stabilizer, plasticier, biocide, etc.
The product does not contain hazardous substances per per the EPA's Resource Conservation and Recovery Act.

Components related to Life Cycle Assessment

The declared unit for the LCA study was covering and protecting 1 square meter (m^2) of substrate. The reference flow required for the declared unit is calculated based on the product coverage on gypsum sheathing joints at 20-30 wet film thickness. The reference flow required for one declared unit is provided in Table 3.

Table 4: Reference flow for one declared unit

Product	Declared Unit	Reference Flow [kg]
Sto RapidGuard®	1	1.22

Scope and Boundaries of the Life Cycle Assessment

The LCA was performed in accordance with ISO 14040 standards. The study is a cradle-to-gate LCA and includes the following life

stages as prescribed in the PCR.

Production			Construction		Use							End of Life				Benefits & Loads Beyond 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 to Site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction	Transport	Waste Processing	Disposal	Reuse, Recovery, Recycling Potential
X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

X = Module Included in LCA Report, ND = Module not Declared

Figure 1: Life stages for the cradle-to-gate LCA

Cut-off Criteria

Material inputs greater than 1% (based on total mass of the final product) were included within the scope of analysis. Material inputs less than 1% were included if sufficient data was available to warrant inclusion and/or the material input was thought to have significant environmental impact. Cumulative excluded material inputs and environmental impacts are less than 5% based on total weight of the declared unit.

Data Quality

The overall data quality level was determined to be good. Primary data was collected from the manufacturing facility in Waconia, MN, USA for the 2021 reference year. When primary data did not exist, secondary data were obtained from the MLC Database Service. Overall, both primary and secondary data are considered good quality in terms of geographic, temporal and technological coverage.

Estimates and Assumption

Assumptions were made to represent the cradle-to-grave environmental performance of Sto's products. These assumptions were made in accordance with the PCR and include the transportation distances, the disposal of packaging material and the product at its end of life and use phase assumptions.

Allocation

General principles of allocation were based on ISO 14040/44. Where possible, allocation was avoided. When allocation was necessary it was done on a physical mass basis.

Product Stage (A1-A3)

Sto RapidGuard® is produced at the manufacturing facility in Waconia, MN, USA. This stage includes an aggregation of raw material extraction, supplier processing, delivery, manufacturing and packaging by Sto. Sto RapidGuard® is supplied in 20-oz sausages or 29-oz catridges.

Life Cycle Assessment Results

As prescribed by the PCR, TRACI 2.1 impact characterization methodology and IPCC 5th assessment report are adopted to calculate the environment impacts. Table 4 provides the acronym key of the impact indicators declared in this EPD.

Table 5: LCIA impact category and LCI Indicator keys

Abbreviation	Parameter	Unit
	IPCC AR5	
GWP	Global warming potential (100 years, includes biogenic CO2)	kg CO_2 eq
	TRACI 2.1	
AP	Acidification potential of soil and water	kg SO_2 eq
EP	Eutrophication potential	kg N eq
ODP	Depletion of stratospheric ozone layer	kg CFC 11 eq
SFP	Smog formation potential	kg O_3 eq
	CML 2001-Jan 2016	
ADPF	Abiotic depletion potential for fossil resources	MJ, net calorific value
	Carbon Emissions and Uptake	
BCRP	Biogenic Carbon Removal from Product	[kg CO_2]
BCEP	Biogenic Carbon Emission from Product	[kg CO_2]
BCRK	Biogenic Carbon Removal from Packaging	[kg CO_2]
BCEK	Biogenic Carbon Emission from Packaging	[kg CO_2]
BCEW	Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	[kg CO_2]
CCE	Calcination Carbon Emissions	[kg CO_2]
CCR	Carbonation Carbon Removals	[kg CO_2]
CWNR	Carbon Emissions from Combustion of Waste from Non- Renewable Sources used in Production Processes	[kg CO_2]
	Resource Use Parameters	
RPR_E	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value (LHV)
RPR_M	Use of renewable primary energy resources used as raw materials	MJ, net calorific value
$NRPR_E$	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value
$NRPR_M$	Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value
SM	Use of secondary materials	kg
RSF	Use of renewable secondary fuels	MJ, net calorific value
NRSF	Use of non-renewable secondary fuels	MJ, net calorific value
RE	Recovered energy	MJ, net calorific value
FW	Net use of fresh water	m^3
	Waste Parameters	
HWD	Disposed-of-hazardous waste	kg
NHWD	Disposed-of non-hazardous waste	kg
HLRW	High-level radioactive waste, conditioned, to final repository	kg
ILLRW	Intermediate- and low-level radioactive waste, conditioned, to final repository	kg
CRU	Components for reuse	kg
MR	Materials for recycling	kg
MER	Materials for energy recovery	kg
EEE	Exported electrical energy	MJ
EET	Exported thermal energy	MJ

Sto RapidGuard®

The LCIA results presented below are for 1 m^2 of Sto RapidGuard®.

Impact Category	A1	A2	A3	Total
IPCC AR5				
GWP [kg CO_2 eq]	3.58E+00	2.32E-01	9.01E-01	4.71E+00
TRACI LCIA Impacts (North America)				
AP [kg SO_2 eq]	1.29E-02	2.31E-03	1.32E-03	1.65E-02
EP [kg N eq]	5.29E-04	1.22E-04	1.05E-04	7.57E-04
ODP [kg CFC 11 eq]	8.02E-13	5.34E-16	4.37E-14	8.46E-13
SFP [kg O_3 eq]	9.04E-02	4.66E-02	1.95E-02	1.57E-01
CML 2001-Jan 2016				
ADPF [MJ]	6.26E+01	3.11E+00	1.09E+01	7.66E+01
Carbon Emissions and Uptake				
BCRP [kg CO_2]	0	0	0	0
BCEP [kg CO_2]	0	0	0	0
BCRK [kg CO_2]	0	0	0	0
BCEK [kg CO_2]	0	0	0	0
BCEW [kg CO_2]	0	0	0	0
CCE [kg CO_2]	0	0	0	0
CCR [kg CO_2]	0	0	0	0

CWNR [kg CO_2]	0	0	4.78E-02	4.78E-02

The LCI results presented below are for 1 m^2 of Sto RapidGuard®.

Impact Category	A1	A2	A3	Total
Resource Use Indicators				
RPR_E [MJ]	3.88E+00	1.03E-01	5.15E+00	9.14E+00
RPR_M [MJ]	0	0	0	0
$NRPR_E$ [MJ]	3.81E+01	3.13E+00	1.32E+01	5.44E+01
$NRPR_M$ [MJ]	1.41E+01	0	0	1.41E+01
SM [kg]	0	0	0	0
RSF [MJ]	0	0	0	0
NRSF [MJ]	0	0	0	0
RE [MJ]	0	0	0	0
FW [m^3]	1.79E-02	3.44E-04	4.68E-03	2.29E-02
Output Flows and Waste Categories				
HWD [kg]	1.04E-05	9.19E-12	2.10E-02	2.10E-02
NHWD [kg]	4.31E-01	2.77E-04	8.91E-03	4.40E-01
HLRW [kg]	1.52E-06	9.11E-09	9.78E-07	2.50E-06
ILLRW [kg]	1.33E-03	7.87E-06	8.18E-04	2.15E-03
CRU [kg]	0	0	0	0
MR [kg]	0	0	0	0
MER [kg]	0	0	0	0
EE [MJ]	0	0	0	0

Interpretation

For the product in study, the largest contributor of the environmental impacts is the raw material sourcing stage, indicating efforts in reducing manufacturing scrap and improving material efficiency will help improve all the evaluated environmental impacts.

Reference

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