Declaration Owner
3form, LLC.
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Product
Chroma - Acrylic Resin panels
UN CPC 369

Declared Unit
The declared unit is 1 kg of panel

EPD Number and Period of Validity
SCS-EPD-04940
EPD Valid April 9, 2018 through April 8, 2023
Version: April 28, 2020

Product Category Rule
Product Category Rule (PCR) for preparing an Environmental Product Declaration (EPD) for Construction Products and CPC 54 Construction Services, v2.2, 2017-05-30

Program Operator
SCS Global Services
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Disclaimers: *This EPD conforms to ISO 14025, 14040, ISO 14044, and ISO 21930.*

Scope of Results Reported: *The PCR requirements limit the scope of the LCA metrics such that the results exclude environmental and social performance benchmarks and thresholds, and exclude impacts from the depletion of natural resources, land use ecological impacts, ocean impacts related to greenhouse gas emissions, risks from hazardous wastes and impacts linked to hazardous chemical emissions.*

Accuracy of Results: *Due to PCR constraints, this EPD provides estimations of potential impacts that are inherently limited in terms of accuracy.*

Comparability: *The PCR this EPD was based on was not written to support comparative assertions. EPDs based on different PCRs, or different calculation models, may not be comparable. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware of the uncertainty in the final results, due to and not limited to, the practitioner's assumptions, the source of the data used in the study, and the specifics of the product modeled.*

PCR review, was conducted by	The Technical Committee of the International EPD® System. Chair: Massimo Marino Contact via info@environdec.com.
Approved Date: April 9, 2018 – End Date: April 8, 2023	
Version: April 28, 2020	
Independent verification of the declaration and data, according to ISO 14025:2006	☐ internal ☑ external
Third party verifier	Tom Gloria, Ph.D., Industrial Ecology Consultants

ABOUT 3form

3form is a leading manufacturer of award-winning building materials and architectural hardware solutions for the Architecture + Design industry. A culture of responsibility at 3form ensures that human health and environmental sustainability are considered in our product designs and manufacturing practices. Utilizing four world-class factories located in the United States, 3form creates high performance translucent resin and glass panels, lighting and acoustic solutions, and other inspired products for indoor and outdoor applications.

PRODUCT DESCRIPTION

3form Chroma is produced from optical grade engineered resin. Chroma is available in thick-gauge formats which lends itself well for use in many horizontal applications. Chroma is a highly functional material that brings impact when color is introduced. Chroma is produced with brilliant colors that can be specified to create an enormous range of hues, opacities and amazing effects. The surface of Chroma can be specified with a durable vellum finish that can be easily refinished throughout its lifetime.

Chroma xt is exterior grade Chroma suitable for use as signage, lighting, awnings, tables or canopies. Use Chroma to bring amazing color and design to your exterior applications. It is an excellent choice in terms of LEED, WELL, and Living Building Challenge with Greenguard Gold Indoor Air Quality certification and a Red List Free Declare Label from the International Living Future Institute (ILFI), and is also recyclable.

PRODUCT CHARACTERISTICS AND PERFORMANCE

Table 1. *Product specifications and performance test results for Chroma panels.*

PROPERTY	ASTM METHOD	METRIC	US
GENERAL			
Density	D 1505	1.19 x 10^{-3} kg/cm^3	74.3 lb/ft^3
Water Absorption	D 579 24hrs @ 73°F	0.2%	0.2%
Sound Transmission Class - 1/2" (12.7 mm) - 1" (25.4 mm)	E 90	32 36	
MECHANICAL			
Tensile Strength	D 638	69 MPa	10,000 psi
Elongation at Rupture	D 638	4.5%	4.5%
Tensile Modulus	D 638	2,800 MPa	400,000 psi
Flexural Strength (rupture)	D 790	117 MPa	17,000 psi
Flexural Modulus	D 790	3,300 MPa	480,000 psi
Compressive Strength (yield)	D 695	117 MPa	17,000 psi
Compressive Deformation	D 621 4000 psi, 122°F, 24 hours)		≤0.85%
Shear Ultimate Strength	D 732	69 MPa	10,000 psi
Shear Modulus	D 5279	1,151 MPa	167,000 psi
Impact Strength (charpy method)	D 6110 notched D 4812 un-notched	0.9 kgf cm/cm 3.17 kgf cm/cm	2.1 lbf in/in 7 lbf in/in
Izod Impact Strength	D 256 notched	≤13.3 J/m	≤0.25 ft-lbf/in
Rockwell Hardness	D 785	M-93	M-93
Barcol Hardness	D 2583	48	48
Residual Shrinkage (internal strain)	D 702	2%	2%
Coefficient of Friction	D 2047 dry D 2047 wet		0.73 0.79
Dynamic Coef. of Friction	ANSI A 137.1	.043 (average of 3 tests, all above 0.42)	
Poisson's Ratio	E 132		0.35-0.40
OPTICAL			
Refractive Index	D 542	1.49	1.49
Light Transmission (total)	D 1003	92%	92%
Haze	D 003	<1%	<1%
THERMAL			
Max Continuous Use Temperature		82°C	180°F
Max Instantaneous Use Temperature		100°C	212°F
Deflection Temperature	D 648 @ 264 psi	90°C	195°F
Vicat Softening Point	D 1525	115°C	239°F
Forming Temperature		149-157°C	300-330°F
Coefficient of Thermal Conductivity (k-factor)	cenco-fitch	0.19 w/m°K	1.3 btu/(hr)ft2(°F)
Coefficient of Thermal Expansion	D 696 @ 60°F (16°C)	7.2 x 10^{-5}(mm/mm/°C)	4.0 x 10^{-5}(in/in/°F)
FLAMMABILITY & SMOKE TESTS			
Smoke Density	ASTM D 2843	Pass Less than 75%	4.1%
Flame Spread	ASTM D 635	Pass CC2	Rate of burning: 1.2 in/min
Self-ignition Temp.	ASTM D 1929	Pass Greater than 650°F	852°F
Flame Spread, 1/2" Thickness Smoke Developed	ASTM E 84	Class C (76-200) 450 (less than 450)	95 450
Flame Spread, 1" Thickness Smoke Developed	ASTM E 84	Class C (76-200) 450 (less than 450)	115 150

MATERIAL COMPOSITION

Table 2. *Material composition of the Chroma panel product in kilograms per functional unit and in percentage of total weight.*

Product Component	Component Material	Kilograms per Functional Unit	Percentage of Total Weight
Primary Components			
Acrylic resin	Polymethyl methacrylate	0.998	99.8%
Auxiliary Components			
Other	plastic film, paper, sealants, coatings, decorative leaves	$2.1x10^{-3}$	0.21%
Total Product		**1.0**	**100%**
Consumptive Components			
Paper	paper	$2.3x10^{-3}$	59%
Plastics	plastic film	$5.2x10^{-4}$	13%
Other	other	$1.1x10^{-3}$	28%
Total Consumptive Components		**$3.92x10^{-3}$**	**100%**
Packaging Components			
Packaging	polyester, polyethylene	$2.7x10^{-3}$	3.1%
Packaging	corrugated board	$1.4x10^{-2}$	16%
Packaging	paper	$3.3x10^{-3}$	3.8%
Packaging	wood crating	$4.7x10^{-3}$	5.5%
Packaging	pallets	$6.1x10^{-2}$	71%
Total Packaging		***$8.5x10^{-2}$***	**100%**

LIFE CYCLE ASSESSMENT STAGES AND REPORTED INFORMATION

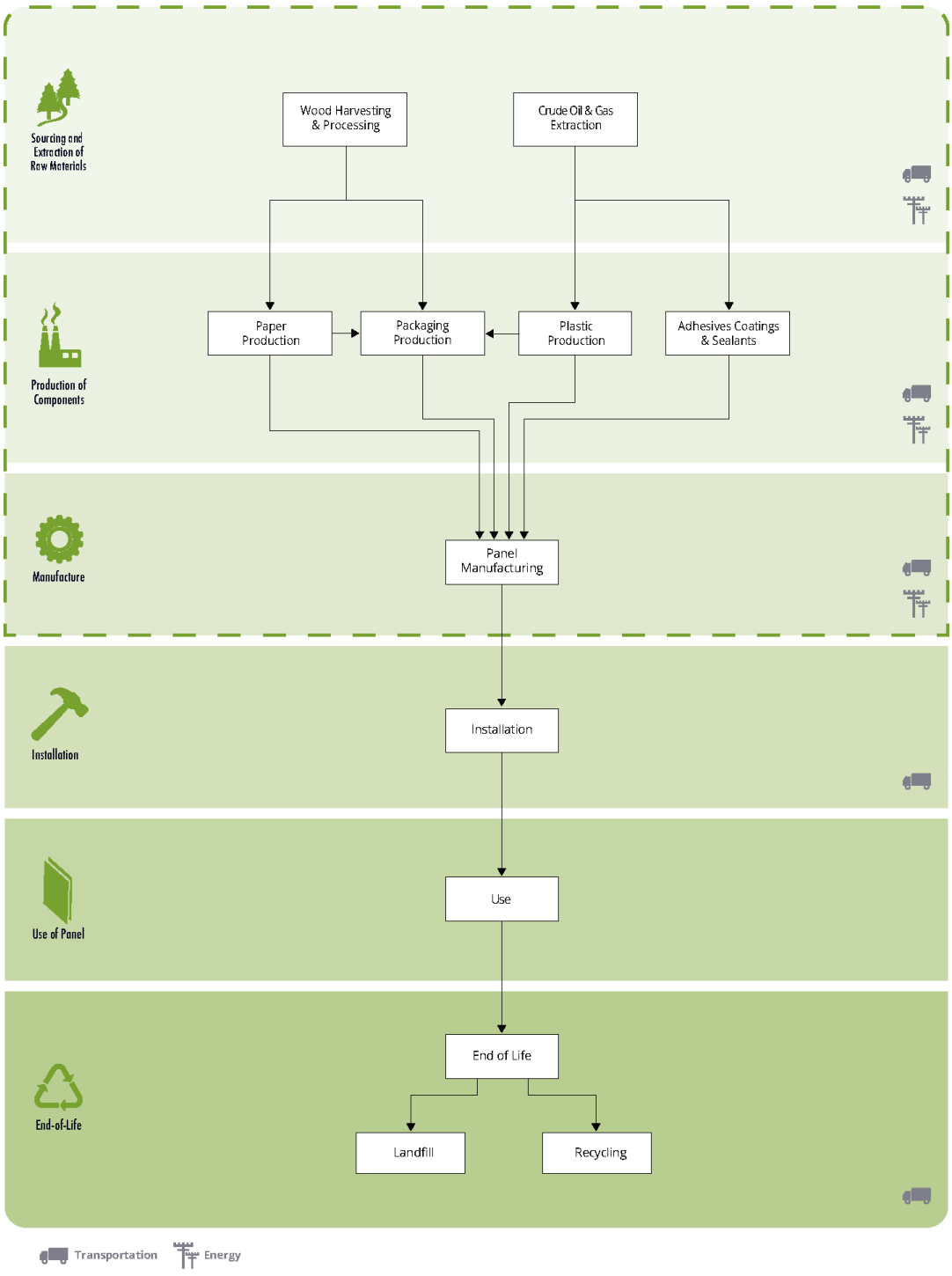
In accordance with the PCR, the life cycle stages included in this EPD are as shown below (X = included, MND = module not declared).

Product			Construction Process		Use							End-of-Life				Benefits & Loads Beyond the System Boundary
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw Materials	Transport	Manufacturing	Transport	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, recovery, and/or recycling potential
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

X = included, MND = module not declared

PRODUCT LIFE CYCLE FLOW DIAGRAM

The diagram below is a representation of the most significant contributions to the life cycle of the *Chroma* panel product. This includes material acquisition and pre-processing, transportation, and product manufacture.



LIFE CYCLE INVENTORY

The life cycle inventory (LCI) flows for the EPD are shown in Table 3, in accordance with the requirements of the PCR.

Table 3. *Life cycle inventory flows for 1 kg of 3form Chroma Panels.*

Parameter	Units	Total	Raw Materials	Transport to the Manufacturer	Manufacturing
			A1	A2	A3
Energy Consumption					
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	1.9 100%	0.12 6.4%	$8.0x10^{-2}$ 4.2%	1.7 89%
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	-	-	-	-
Total use of renewable primary energy resources	MJ, net calorific value	1.9 100%	0.12 6.4%	$8.0x10^{-2}$ 4.2%	1.7 89%
Use of nonrenewable primary energy excluding nonrenewable primary energy resources used as raw materials	MJ, net calorific value	INA	INA	INA	INA
Use of nonrenewable primary energy resources used as raw materials	MJ, net calorific value	INA	INA	INA	INA
Total use of nonrenewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	120 100%	110 91%	4.3 3.5%	6.5 5.3%
Use of secondary materials	kg	-	-	-	-
Use of renewable secondary fuels	MJ, net calorific value	Negligible	Negligible	Negligible	Negligible
Use of nonrenewable secondary fuels	MJ, net calorific value	Negligible	Negligible	Negligible	Negligible
Water Consumption					
Freshwater consumed	m^3	0.54 100%	0.53 97%	$4.1x10^{-3}$ 0.76%	$1.0x10^{-2}$ 1.8%
Wastes					
Hazardous Waste	kg	$1.2x10^{-5}$ 100%	$5.1x10^{-7}$ 4.3%	$3.0x10^{-6}$ 25%	$8.3x10^{-6}$ 70%
Non-hazardous Waste	kg	0.20 100%	$1.9x10^{-3}$ 0.98%	0.12 60%	$7.6x10^{-2}$ 39%
Radioactive Waste	kg	$3.2x10^{-5}$ 100%	$7.3x10^{-7}$ 2.3%	$2.7x10^{-5}$ 82%	$5.1x10^{-6}$ 16%
Components for re-use [CRU]	kg	-	-	-	-
Materials for recycling [MFR]	kg	Negligible	Negligible	Negligible	Negligible
Materials for energy recovery [MER]	kg	Negligible	Negligible	Negligible	Negligible
Exported energy [EEE]	MJ eq.	Negligible	Negligible	Negligible	Negligible
Use of renewable material resources [RMR]	kg	-	-	-	-

LIFE CYCLE IMPACT ASSESSMENT

The life cycle impact assessment (LCIA) for the EPD is conducted in accordance with requirements of the PCR. Impact category indicators are estimated using the TRACI 2.1 and CML-IA baseline characterization method. Results for Global Warming Potential, Acidification Potential, Ozone Depletion Potential, Photochemical Ozone Creation Potential and Eutrophication Potential are based on TRACI 2.1 and CML-IA 4.1 method. Results for Abiotic Depletion Potential (elements and fossil fuels) are based on the CML-IA 4.1 method. The LCIA results are calculated using SimaPro 8.3 software.

Table 4. *Cradle-to-Gate CML Life Cycle Impact Assessment Results for 1 kg of 3form Chroma Panels.*

Impact Category	Units	Total	Raw Materials	Transport to the Manufacturer	Manufacturing
			A1	A2	A3
Global Warming Potential (GWP-100)	kg CO_2 eq	5.3 100%	4.5 85%	0.28 5.3%	0.52 9.8%
Acidification Potential	kg SO_2 eq	$3.0x10^{-2}$ 100%	$2.6x10^{-2}$ 88%	$1.7x10^{-3}$ 5.7%	$1.9x10^{-3}$ 6.3%
Eutrophication Potential	kg PO_4^{3-} eq	$4.6x10^{-3}$ 100%	$3.6x10^{-3}$ 77%	$4.2x10^{-4}$ 9.1%	$6.2x10^{-4}$ 13%
Photochemical Ozone Creation Potential	kg C_2H_4 eq	$1.3x10^{-3}$ 100%	$1.1x10^{-3}$ 87%	$6.2x10^{-5}$ 4.9%	$1.0x10^{-4}$ 7.9%
Ozone Depletion Potential	kg CFC-11 eq	$5.4x10^{-7}$ 100%	$4.6x10^{-7}$ 86%	$4.7x10^{-8}$ 8.8%	$3.0x10^{-8}$ 5.6%
Abiotic Depletion Potential (elements)	Kg Sb eq	$4.2x10^{-6}$ 100%	$3.4x10^{-6}$ 81%	$6.0x10^{-7}$ 14%	$2.2x10^{-7}$ 5.1%
Abiotic Depletion Potential (fossil fuels)	MJ, net calorific value	110 100%	99 91%	4.2 3.9%	6.1 5.6%

Table 5. *Cradle-to-Gate TRACI Life Cycle Impact Assessment Results for 1 kg of 3form Chroma Panels.*

Impact Category	Units	Total	Raw Materials	Transport to the Manufacturer	Manufacturing
			A1	A2	A3
Global Warming Potential (GWP-100)	kg CO_2 eq	5.4 100%	4.6 85%	0.28 5.3%	0.51 9.5%
Acidification Potential	kg SO_2 eq	$2.8x10^{-2}$ 100%	$2.4x10^{-2}$ 86%	$2.1x10^{-3}$ 7.3%	$1.8x10^{-3}$ 6.3%
Eutrophication Potential	kg N eq	$8.6x10^{-3}$ 100%	$6.8x10^{-3}$ 79%	$4.4x10^{-4}$ 5.2%	$1.4x10^{-3}$ 16%
Photochemical Ozone Creation Potential	kg O_3 eq	0.24 100%	0.17 71%	$5.5x10^{-2}$ 23%	$1.4x10^{-2}$ 5.7%
Ozone Depletion Potential	kg CFC-11 eq	$6.2x10^{-7}$ 100%	$5.4x10^{-7}$ 88%	$4.7x10^{-8}$ 7.6%	$3.0x10^{-8}$ 4.8%

ADDITIONAL ENVIRONMENTAL INFORMATION

US Green Building Council
As a long-time member of the USGBC, 3form recognizes the importance of the LEED rating system to sustainable design. 3form materials help achieve LEED credits across a number of categories and were selected for use in the USGBC's headquarters in Washington DC. We are committed to promoting sustainable building practices and education through our national and local Chapter memberships.

Red List Free Label
Chroma has demonstrated that it avoids the use of hazardous chemicals through the Declare Red List Free Label, issued by International Living Future Institute™.

GREENGUARD
Third party certification gives assurance that products and building materials designed for use indoors meet strict chemical emissions limits. Includes performance-based standards to define products and processes with low chemical and particle emissions.

Salt Lake City e2 Business
The Salt Lake City Environmentally and Economically sustainable (e2) business program is designed to recognize and support the Salt Lake City business community and economy. 3form is an e2 Business.

Bonneville Environmental Foundation
Through Bonneville Environmental Foundation, 3form supports Green-e Climate certified renewable energy projects. These projects avoid greenhouse gas emissions and help us offset the emissions we generate in our operations and business travel.

Renewable Energy Credits
Through Blue Sky and their partner 3Degrees, 3form supports Green-e Energy certified renewable energy projects to offset the impact of our electricity use. This support encourages the development of new renewable energy projects, benefits the environment, and helps influence the future of energy production.

SUPPORTING TECHNICAL INFORMATION

Unit processes are developed with SimaPro 8.3 software, drawing upon data from multiple sources. Primary data were provided by 3form and their suppliers for their manufacturing and fabrication processes. The primary sources of secondary LCI data are from the Ecoinvent Database and Plastics Europe ecoprofiles.

Table 6. *Data sources used for the LCA study.*

Component	Material Description	Material Dataset	Data Source	Publication Date
Product Materials				
Primary Components				
Acrylic resin	PMMA	Polymethyl methacrylate, beads {GLO}| market for | Alloc Rec	Plastics Europe[2]	2015
Auxiliary Components				
Other	plastic film, paper, sealants, coatings, decorative leaves	PET fabric (CRI); Chemical, organic {GLO}| market for | Alloc Rec; Grass, organic {GLO}| market for | Alloc Rec	CRI[3]; Ecoinvent[1]; Ecoinvent[1]	2015; 2016; 2016
Consumptive Components				
Paper	NA	Kraft paper, unbleached {GLO}| market for | Alloc Rec	Ecoinvent[1]	2016
Plastics	NA	Polyester resin, unsaturated {GLO}| market for | Alloc Rec; Nylon 6 {GLO}| market for | Alloc Rec	Ecoinvent[1]; Ecoinvent[1]	2016; 2016
Other	NA	Chemical, organic {GLO}| market for | Alloc Rec: Acrylic binder, without water, in 34% solution state {GLO}| market for | Alloc Rec	Ecoinvent[1]; Ecoinvent[1]	2016; 2016
Product Manufacture				
Electricity	NA	Electricity, medium voltage, at grid/NWPP 2015	Ecoinvent[4]	2015
Natural gas combustion	NA	Heat, central or small-scale, natural gas {GLO} | market group for | Alloc Rec	Ecoinvent[1]	2016
Packaging				
Packaging	polyester, polyethylene	Polyethylene, low density, granulate {GLO}| market for | Alloc Rec; Packaging film, low density polyethylene {GLO}| market for | Alloc Rec; Polyethylene terephthalate, granulate, amorphous {GLO}| market for | Alloc Rec	Ecoinvent[1]	2016
Packaging	corrugated board	Packaging, corrugated board, mixed fibre, single wall, at plant/RER	Ecoinvent[1]	2016
Packaging	paper	Kraft paper, unbleached {GLO}| market for | Alloc Rec	Ecoinvent[1]	2016
Packaging	wood crating	Oriented strand board {GLO} | market for | Alloc Rec; Sawnwood, softwood, raw {GLO} | market for | Alloc Rec	Ecoinvent[1]	2016
Packaging	pallets	Wood pallet (22kg)/ RER	Ecoinvent[4]	2010
Transportation				
Transport	Truck	Transport, freight, lorry 16-32 metric ton, EURO4 {GLO} | market for | Alloc Rec	Ecoinvent[1]	2016
Transport	Rail	Transport, freight train {US} | market for | Alloc Rec	Ecoinvent[1]	2016

1) Ecoinvent v3.3 2016. Swiss Center for Life Cycle Inventories, 2016 http://www.ecoinvent.org
2) Plastics Europe ecoprofiles. http://www.plasticseurope.org/plastics-sustainability-14017/eco-profiles.aspx
3) Carpet & Rug Institute (CRI). www.carpet-rug.org
4) Ecoinvent v2.2 2010. Swiss Center for Life Cycle Inventories, 2010 http://www.ecoinvent.org

Data Quality

Data Quality Parameter	Data Quality Discussion
Time-Related Coverage: Age of data and the minimum length of time over which data is collected	The most recent available data are used, based on other considerations such as data quality and similarity to the actual operations. Typically, these data are representative of 2015 or more recent. All of the data used represented an average of at least one year's worth of data collection, and up to three years in some cases. Manufacturer-supplied data (primary data) are based on annual production for 2016.
Geographical Coverage: Geographical area from which data for unit processes is collected to satisfy the goal of the study	The data used in the analysis provide the best possible representation available with current data. Actual processes for upstream operations are primarily North American. Surrogate data used in the assessment are representative of North American or European operations. Data representative of European operations are considered sufficiently similar to actual processes. Data representing product disposal are based on US statistics.
Technology Coverage: Specific technology or technology mix	For the most part, data are representative of the actual technologies used for processing, transportation, and manufacturing operations. Representative fabrication datasets, specific to the type of material, are used to represent the actual processes, as appropriate.
Precision: Measure of the variability of the data values for each data expressed	Precision of results are not quantified due to a lack of data. Data collected for operations were typically averaged for one or more years and over multiple operations, which is expected to reduce the variability of results.
Completeness: Percentage of flow that is measured or estimated	The LCA model included all known mass and energy flows for production of the panel products. In some instances, surrogate data used to represent upstream and downstream operations may be missing some data which is propagated in the model. No known processes or activities contributing to more than 1% of the total environmental impact for each indicator are excluded. In total, these missing data represent less than 5% of the mass or energy flows.
Representativeness: Qualitative assessment of the degree to which the data set reflects the true population of interest	Data used in the assessment represent typical or average processes as currently reported from multiple data sources, and are therefore generally representative of the range of actual processes and technologies for production of these materials. Considerable deviation may exist among actual processes on a site-specific basis; however, such a determination would require detailed data collection throughout the supply chain back to resource extraction.
Consistency: Qualitative assessment of whether the study methodology is applied uniformly to the various components of the analysis	The consistency of the assessment is considered to be high. Data sources of similar quality and age are used with a bias towards Ecoinvent v3.3 data where available. Different portions of the product life cycle are equally considered.
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	Based on the description of data and assumptions used, this assessment would be reproducible by other practitioners. All assumptions, models, and data sources are documented.
Sources of the Data: Description of all primary and secondary data sources	Data representing energy use at the 3form Utah facility represent an annual average and are considered of high quality due to the length of time over which these data are collected, as compared to a snapshot that may not accurately reflect fluctuations in production. The Ecoinvent v3.3 database is used for secondary LCI datasets. The Plastics Europe eco-profile database provided was sourced for some plastics LCI data
Uncertainty of the Information: Uncertainty related to data, models, and assumptions	Uncertainty related to materials in the panel products and packaging is low. Actual supplier data for upstream operations was not available for suppliers and the study relied upon the use of existing representative datasets. These datasets contained relatively recent data (<10 years), but lacked geographical representativeness. Uncertainty related to the impact assessment methods used in the study are high. The impact assessment method required by the PCR includes impact potentials, which lack characterization of providing and receiving environments or tipping points.

Allocation

Resource use at the Salt Lake City, Utah facility (e.g., water and energy) was allocated to the product based on the product mass as a fraction of the total facility productions.

Impacts from transportation were allocated based on the mass of material and distance transported.

System boundaries

The EPD for the 3form products is cradle-to-gate (i.e., Production Stage). The system boundaries for this study are as follows:

- **Sourcing/extraction stage (A1) –** This stage includes extraction of virgin materials and reclamation of nonvirgin feedstock. Resource use and emissions associated with both extraction of the raw materials product component manufacturing are included. Upstream transportation is also included.
- **Transport to manufacturing stage (A2) –** This stage includes all the relevant manufacturing processes and flows, including packaging. Production of capital goods, infrastructure, production of manufacturing equipment, and personnel-related activities are not included.
- **Manufacturing stage (A3) –** This stage includes all the relevant manufacturing processes and flows, including packaging. Production of capital goods, infrastructure, production of manufacturing equipment and personnel related activities are not included.

Cut-off criteria

According to the PCR, mass and energy flows that consist of less than 1% may be omitted from the inventory analysis. Cumulative omitted mass or energy flows shall not exceed 5%. In the present study, except as noted, all known materials and processes were included in the life cycle inventory.

REFERENCES

1. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA, 19428-2959 USA. http://www.astm.org/Standard/index.shtml
2. CML-IA Characterization Factors. Institute of Environmental Sciences. Leiden University. Netherlands.
3. Ecoinvent Centre (2016) Ecoinvent data from v3.3. Swiss Center for Life Cycle Inventories, Dubendorf, 2016, http://www.ecoinvent.org
4. ISO 14025: 2006 Environmental labels and declarations – Type III environmental declarations – Principles and Procedures
5. ISO 14040: 2006 Environmental Management – Life cycle assessment – Principles and framework
6. ISO 14044: 2006 Environmental Management – Life cycle assessment – Requirements and Guidelines.
7. ISO 21930: 2007 Sustainability in building construction – Environmental declaration of building products.
8. SCS Global Services. Life Cycle Assessment of Varia Ecoresin, Chroma, Koda and Pressed Glass Panels. February 2018. Final Report. Prepared for 3form.
9. SCS Type III Environmental Declaration Program: Program Operator Manual v9.0. January 2018. SCS Global Services
10. Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI). Version 2.1. US Environmental Production Agency.
11. Product Category Rule for Construction Products and Construction Services. Product Group Classification: Multiple UN CPC Codes. International EPD® System. 2012:01. Version 2.2. May 2017.
12. Addendum for Adapting the International EPD® System PCR for use in North America. Construction Products and Construction Services. Product Group Classification. SCS Global Services. September 27, 2017.

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