

## Environmental Product Declaration

In accordance with ISO 14025:2006, EN 15804:2012+A2:2019/AC:2021, and ISO 21930:2017

### **Formica® Brand Laminate sheets – Grade 12 (0.035")**

*By Formica Corporation*

By Nemho, centre of excellence for innovation and technology for Broadview Holding B.V.

Programme	The International EPD® System
Programme operator	<a href="http://www.environdec.com">www.environdec.com</a> EPD International AB
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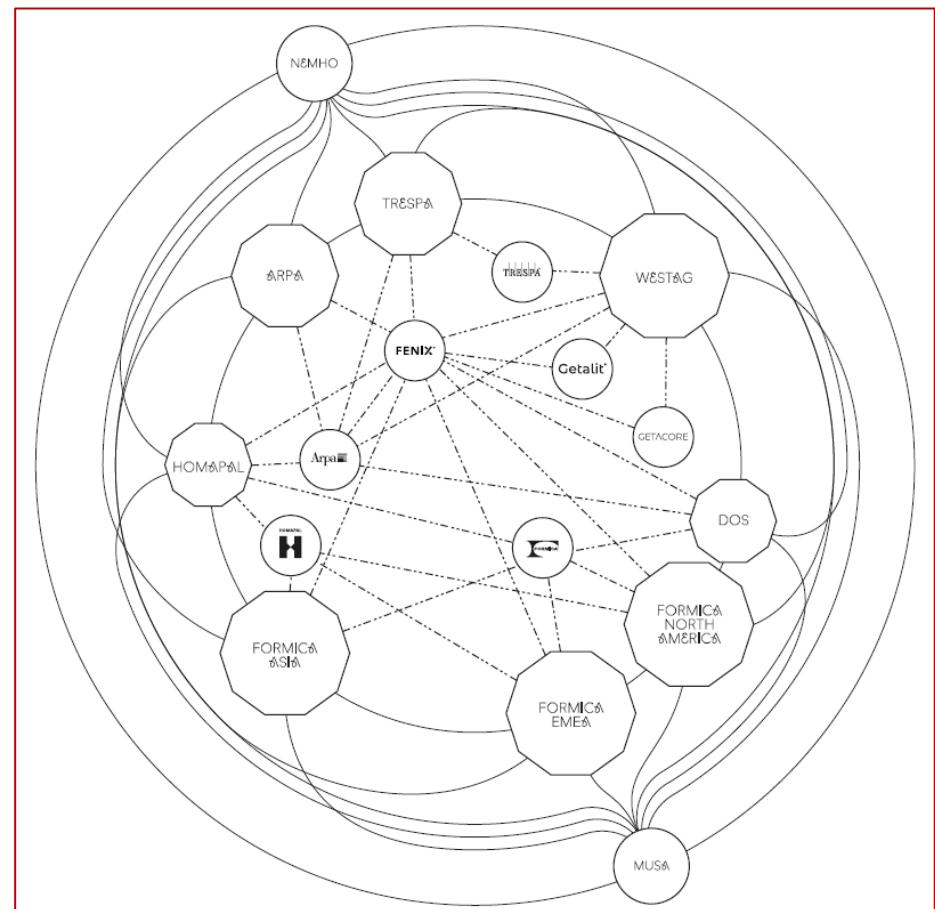
*An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at [www.environdec.com](http://www.environdec.com)*

# FORMICA CORPORATION

Formica Corporation was founded in 1913 in Cincinnati, Ohio as The Formica Products Company by former Westinghouse engineers Daniel J. O'Conor and Herbert Faber. The two discovered high-pressure plastic resins could be used as an effective substitute "for mica" in electrical componentry, and with their invention, they created a new category of materials known as high-pressure laminate (HPL). Formica® Brand Laminates became well known for its fashionable designs, durability and ease of cleaning, and Formica surfaces were broadly used in cafes, railway cars and ocean liners. Fast forward to today, the modern-day Formica Corporation remains committed to innovation and maintaining a leading position in design and manufacture of high quality HPL surfaces for applications ranging from health care to single-family homes, education to hospitality, retail to multi-family residences. Today, Formica Corporation operates manufacturing facilities in Cincinnati, Ohio and St. Jean-sur-Richelieu, Quebec along with a network of distribution warehouses across the United States, Canada and Mexico.

Formica® brand laminate products conform to the following characteristics:

- FSC
- NSF/ANSI 35 High pressure Decorative Laminates for Food Surfacing Equipment
- Greenguard Gold
- ANSI/NEMA Standards





## NEMHO

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Nemho is located in Weert in the Netherlands and it is the Innovation Centre of the material companies of the Broadview Holding, namely Arpa Industriale, Trespa International, Formica, Homapal, Westag and DOS. Nemho carries out all sustainability-related activities, including LCA studies, for the above-mentioned companies.

Nemho is the owner of this EPD.

Contact Person: Sara Corrado ([s.corrado@nemho.com](mailto:s.corrado@nemho.com)).



## FORMICA® BRAND LAMINATE SHEETS – GRADE 12 (0.035")

Formica® brand laminates are comprised of paper, melamine resin impregnated surface sheets and phenolic resin impregnated core structural components. The layers are pressed under high temperatures and pressures where polymerization and consolidation take place. There is an extra tough, scuff and mar resistant Elite Form technology that is applied to the melamine surface prior to pressing.

Formica® Brand Laminate – post-forming laminate grade 12 is intended for application to interior horizontal or vertical surfaces requiring 5/8" (15.9 mm) or greater outside radiused edges, and/or 3/16" (4.8mm) cove radii, where design, appearance, quality,

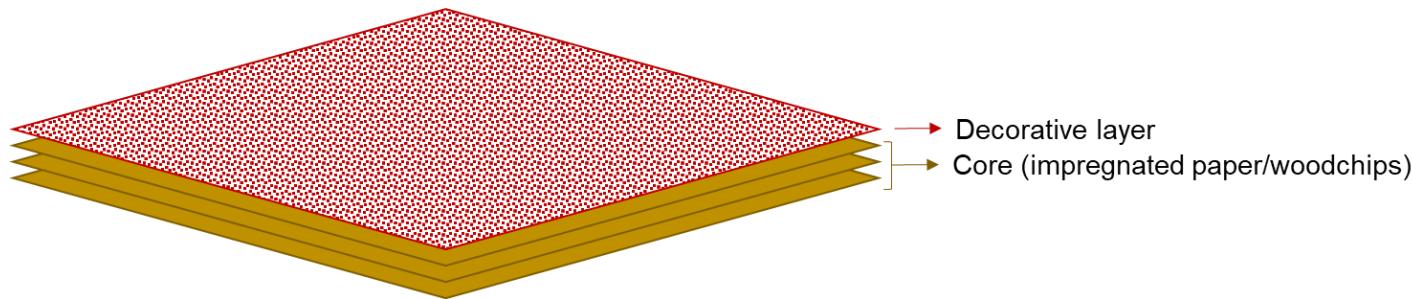
durability, resistance to stain, and resistance to heat from ordinary sources are important considerations.

### *PRODUCT IDENTIFICATION*

High pressure decorative panels (high-pressure laminates, HPL) are tested in accordance to the NEMA LD3-2005 standard.

### *UN CPC CODE*

Not applicable.



## METHODOLOGY

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This EPD has been developed based on the PCR for construction products 2019:14, Version 1.3.2. 2019:14.

### *DECLARED UNIT*

The declared unit is 1 square meter of finished panel, 0.035" thick, weighing 1.150 kg, plus primary packaging. All the possible product décor layers, different for the color and for the finishing, are covered by this EPD.

Formica® Brand Laminate sheets – Grade 12 corresponds to a weighted average of panels produced in the plants of Evendale (Ohio, USA), and Saint-Jean (Quebec, Canada).

### *REFERENCE SERVICE LIFE*

Not applicable.

### *TIME REPRESENTATIVENESS*

Data used for the LCA calculation refer to the production year 2022.

### *DATA, DATABASE(S) AND LCA SOFTWARE*

Activities under the direct control of the company are modelled using specific data.

The LCA study was performed with the support of the Simapro LCA software (version 9.5).

Generic data are taken from Ecoinvent 3.9.1 and Carbon Minds database.

### *ELECTRICITY MODELLING*

The residual electricity mix is used for the manufacturing processes of Formica Saint-Jean (Quebec, Canada), the vast majority (> 95%) of the residual electricity mix is sourced from hydropower.. Guarantees of Origin (GO) sourced from hydropower are used in the model for Formica Evendale (Ohio, USA). In total, the average electricity model results in climate impact (GWP-GHG) of 0,016 kg CO2 eq/kWh.

### *ALLOCATION APPROACH*

Environmental impacts of multi-output processes at the plant level are allocated to the outputs based on their mass.

### *INFRASTRUCTURES AND CAPITAL GOODS*

Infrastructures and capital goods are excluded for core processes (module A3). They are instead included in upstream and downstream processes taken from ecoinvent database (modules A1-A2, C1, C2, and C3).

### *ENVIRONMENTAL PERFORMANCE ASSESSMENT*

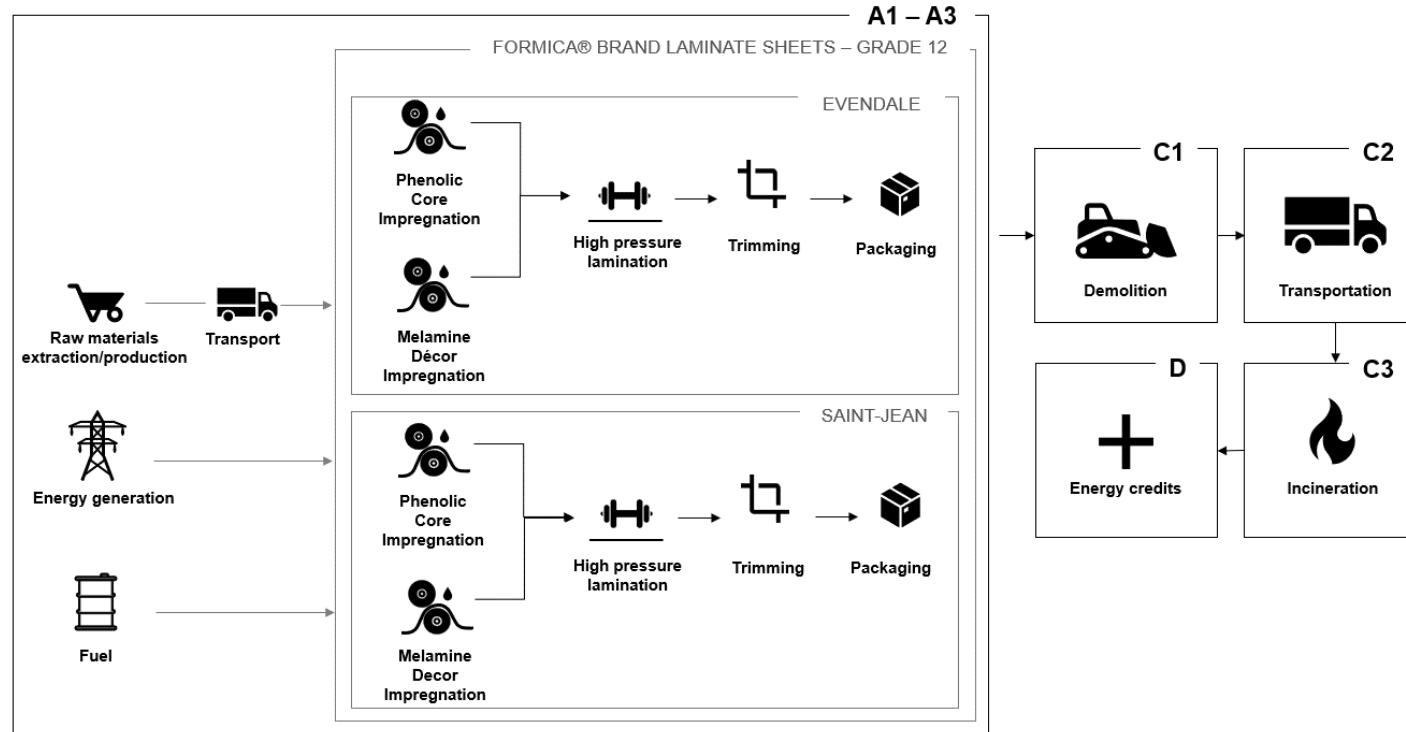
Mandatory potential impact indicators are calculated using the EN 15804 reference package based on EF 3.0.

# SYSTEM BOUNDARIES

The system boundary of this EPD is from cradle to gate with modules C1–C4 and module D (A1–A3 + C + D).

The product stage (modules A1–A3) includes the manufacturing process of Formica® Brand Laminate sheets – Grade 12, carried out in the plants of Evendale (Ohio, USA), and Saint-Jean (Quebec, Canada), the production of raw materials, electricity, and natural gas.

The deconstruction of Formica® Brand Laminate sheets – Grade 12 (module C1) is modelled according to Gervasio et al. (2018). The transport of HPLs at the end of life (module C2) assumed an average transport distance equal to 100km. HPLs are commonly used as secondary material for energy recovery, therefore it is assumed that 100% of the HPL at the end of life is sent to incineration with thermal efficiency higher than 60% (module C3). Loads from material incineration and resulting energy credits (module D) are declared. Energy credits are calculated considering a lower heating value (LHV) of panels equal to 19 MJ/kg as reported by ICDLI (2015).



**MODULES DECLARED, GEOGRAPHICAL SCOPE, SHARE OF SPECIFIC DATA (IN GWP-GHG INDICATOR) AND DATA VARIATION**

	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	USA/CAN	ND	ND	ND	ND	ND	ND	ND	ND	ND	GLO	GLO	GLO	GLO	GLO
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

X: module declared, ND: module not declared



## CONTENT INFORMATION

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Paper	0.837 ± 0.017	0%	72.8% ± 1.5% 0.398 ± 0.008
Phenolic resin	0.214 ± 0.004	0%	1.4% ± 0.0% 0.006 ± 0.000
Melamine resin	0.099 ± 0.002	0%	0.0% ± 0.0% 0 ± 0
<b>TOTAL</b>	<b>1.150 ± 0.023</b>	<b>0%</b>	<b>74.2% ± 1.5%</b> <b>0.404 ± 0.008</b>

Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
LLPDE	0.004	0%	0.0%
<b>TOTAL</b>	<b>0.004</b>	<b>0%</b>	<b>0.0%</b>

The biogenic carbon content of the product and packaging is respectively 1,71 kgCO<sub>2</sub> eq/m<sup>2</sup> and 0,00 kgCO<sub>2</sub> eq/m<sup>2</sup>.

Formica® Brand Laminate sheets – Grade 12 does not contain substances listed on the candidate list of Substances of Very High Concern, as published on the ECHA website, in concentrations exceeding 0.1 percentage by mass.

# ENVIRONMENTAL PERFORMANCE

## POTENTIAL ENVIRONMENTAL IMPACT – MANDATORY INDICATORS ACCORDING TO EN 15804

Results for 1 m <sup>2</sup> of Formica® Brand Laminate sheets – Grade 12							
Indicator	Unit	Tot.A1-A3	C1	C2	C3	C4	D
Climate change – total	kg CO <sub>2</sub> eq.	2.46E+00	7.49E-02	1.23E-02	2.41E+00	0.00E+00	-1.58E+00
Climate change - fossil	kg CO <sub>2</sub> eq.	3.84E+00	7.46E-02	1.23E-02	7.00E-01	0.00E+00	-1.58E+00
Climate change – biogenic	kg CO <sub>2</sub> eq.	-1.39E+00	1.88E-04	4.52E-06	1.71E+00	0.00E+00	-2.35E-03
Climate change – land use and land use change	kg CO <sub>2</sub> eq.	1.19E-02	1.52E-04	6.04E-06	9.73E-06	0.00E+00	-1.90E-03
Ozone depletion	kg CFC 11 eq.	2.19E-07	4.62E-10	1.98E-10	2.38E-09	0.00E+00	-1.84E-08
Acidification	mol H <sup>+</sup> eq.	1.51E-02	3.55E-04	5.27E-05	3.96E-04	0.00E+00	-4.79E-03
Eutrophication aquatic freshwater	kg P eq.	1.36E-04	3.66E-06	1.13E-07	4.10E-07	0.00E+00	-4.56E-05
Eutrophication aquatic marine	kg N eq.	4.28E-03	6.40E-05	1.91E-05	1.92E-04	0.00E+00	-9.20E-04
Eutrophication terrestrial	mol N eq.	4.38E-02	7.12E-04	2.07E-04	1.94E-03	0.00E+00	-1.02E-02
Photochemical ozone formation	kg NMVOC eq.	1.48E-02	2.11E-04	7.43E-05	4.77E-04	0.00E+00	-3.77E-03
Depletion of abiotic resources - minerals and metals*	kg Sb eq.	1.46E-05	6.62E-08	3.27E-08	8.53E-08	0.00E+00	-1.45E-06
Depletion of abiotic resources - fossil fuels*	MJ	6.08E+01	9.42E-01	1.76E-01	3.03E-01	0.00E+00	-2.07E+01
Water use*	m <sup>3</sup> eq.	3.97E+00	1.27E-02	9.09E-04	3.07E-03	0.00E+00	-1.65E-01

\* 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 results of the impact categories abiotic depletion of minerals and metals may be highly uncertain in LCAs that include capital goods/infrastructure in generic datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.



**POTENTIAL ENVIRONMENTAL IMPACT – ADDITIONAL MANDATORY AND VOLUNTARY INDICATORS**

Results per for 1 m <sup>2</sup> of Formica® Brand Laminate sheets – Grade 12							
Indicator	Unit	Tot.A1-A3	C1	C2	C3	C4	D
GWP-GHG**	kg CO <sub>2</sub> eq.	4.39E+00	7.30E-02	1.20E-02	7.00E-01	0.00E+00	-1.54E+00

**POTENTIAL ENVIRONMENTAL IMPACT – ADDITIONAL VOLUNTARY INDICATORS. RESULTS FOR NORTH AMERICA CALCULATED ACCORDING TO ISO 21930**

Results per for 1 m <sup>2</sup> of Formica® Brand Laminate sheets – Grade 12							
Indicator	Unit	Tot.A1-A3	C1	C2	C3	C4	D
Climate change – GWP 100 (ISO 21930)	kg CO <sub>2</sub> eq.	3.90E+00	7.19E-02	1.19E-02	7.00E-01	0.00E+00	-1.52E+00
Ozone depletion - ODP (ISO 21930)	kg CFC-11 eq.	2.34E-07	8.35E-10	2.17E-10	2.50E-09	0.00E+00	-2.36E-08
Eutrophication potential - EP (ISO 21930)	kg N eq	3.38E-03	3.49E-05	4.35E-06	1.01E-04	0.00E+00	-4.55E-04
Acidification potential - AP (ISO 21930)	kg SO <sub>2</sub> eq	1.26E-02	3.05E-04	4.72E-05	3.65E-04	0.00E+00	-4.11E-03
Photochemical ozone formation potential – POCP (ISO 21930)	kg O <sub>3</sub> eq.	2.07E-01	4.04E-03	1.19E-03	1.12E-02	0.00E+00	-5.81E-02

*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.*

*\*\* The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product.*

## USE OF RESOURCES

Results for 1 m <sup>2</sup> of Formica® Brand Laminate sheets – Grade 12							
Indicator	Unit	Tot.A1-A3	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE)***	MJ	5.36E+01	1.15E-01	2.23E-03	1.20E+00	0.00E+00	-1.41E+00
Use of renewable primary energy resources used as raw materials (PERM)***	MJ	5.95E+00	0.00E+00	0.00E+00	-3.57E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (PERT)***	MJ	5.96E+01	1.15E-01	2.23E-03	-2.37E+00	0.00E+00	-1.41E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE)***	MJ	5.23E+01	9.42E-01	1.76E-01	2.00E+00	0.00E+00	-2.07E+01
Use of non-renewable primary energy resources used as raw materials (PENRM)***	MJ	8.48E+00	0.00E+00	0.00E+00	-5.09E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy re-sources (PENRT)***	MJ	6.08E+01	9.42E-01	1.76E-01	-3.09E+00	0.00E+00	-2.07E+01
Use of secondary material (SM)	kg	2.62E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels (RSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels (NRSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water (FW)	m <sup>3</sup>	1.15E-01	5.04E-04	2.81E-05	2.24E-04	0.00E+00	-6.37E-03

\*\*\* Primary energy use indicators are calculated following option B described in Annex 3 of PCR for Construction products v 1.3.2.



## WASTE PRODUCTION

Results for 1 m <sup>2</sup> of Formica® Brand Laminate sheets – Grade 12							
Indicator	Unit	Tot.A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	4.89E-03	2.96E-05	4.96E-06	8.51E-02	0.00E+00	-4.18E-04
Non-hazardous waste disposed	kg	7.32E-01	4.31E-03	1.53E-02	4.13E-02	0.00E+00	-6.55E-02
Radioactive waste disposed	kg	9.44E-05	2.54E-06	3.84E-08	5.63E-07	0.00E+00	-3.08E-05

## OUTPUT FLOWS

Results for 1 m <sup>2</sup> of Formica® Brand Laminate sheets – Grade 12							
Indicator	Unit	Tot.A1-A3	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
Material for recycling	kg	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
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	4.33E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	8.78E+00	0.00E+00	0.00E+00

## ADDITIONAL INFORMATION

Reducing the carbon footprint is key for our overall sustainability policy and it is based on our core belief that it is the right thing to do. We are also convinced that reducing our overall environmental footprint is essential to the long-term success of our business and the environment around us. That is why sustainability is embedded in our business philosophy with the credo 'do no harm, do good, do better.'

At the core of our sustainability strategy is the principle that we should start with ourselves when we seek to improve the world: 'do no harm.' Our approach is straightforward: we measure our impact, select targets to reduce this impact and monitor and report on progress. To measure our impact, we use the Life Cycle Assessment (LCA) methodology.

The second element of our strategy is to look for opportunities that support the environment beyond the direct scope of our own manufacturing footprint: 'do good.' This includes creating highly durable products that have a long lifespan that limit the need for replacement. Additionally, we will develop projects that absorb or reduce carbon emissions that are not directly linked to our factories or product portfolio.

We believe that addressing sustainability challenges will allow our company to continue to grow and 'do better' in the future. Investing in sustainability should – in the end – ensure that these efforts go beyond established regulatory requirements and the net effect of our efforts will positively impact the environment in which we operate.

Further details on our philosophy, approach and goals can be found in our position paper available online ([Position paper](#)).



## PROGRAM INFORMATION

<b>Programme:</b>	The International EPD® System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
<b>Website:</b>	<a href="http://www.environdec.com">www.environdec.com</a>
<b>E-mail:</b>	<a href="mailto:info@.environdec.com">info@.environdec.com</a>
<b>Product Category Rules (PCR)</b>	
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)	
Product category rules (PCR): PCR 2019:14 CONSTRUCTION PRODUCTS VERSION 1.3.2	
PCR review was conducted by: the Technical Committee of the International EPD® System. Chair of the review is Claudia A. Peña. The review panel may be contacted via <a href="mailto:info@.environdec.com">info@.environdec.com</a>	
<b>Life Cycle Assessment (LCA)</b>	
LCA accountability: David Sette, Nemho	
<b>Third-party verification</b>	
Independent third-party verification of the declaration and data, according to ISO 14025:2006 via:	
<input checked="" type="checkbox"/> EPD verification by EPD Process Certification*	
Internal auditor: Lara Naested, Nemho	
Third-party verification: SGS Italia S.p.A. Via Caldera 21, 20153 Milano. ( <a href="http://www.it.sgs.com">www.it.sgs.com</a> ) is an approved certification body accountable for third-party verification	
Third-party verifier is accredited by: <i>Accredia, certificate n.0005VV</i>	
*For EPD Process Certification, an accredited certification body certifies and reviews the management process and verifies EPDs published on a regular basis. For details about third-party verification procedure of the EPDs, see GPI v.4, Section 7.5.	
Procedure for follow-up of data during EPD validity involves third party verifier:	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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.

## REFERENCES

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- General Programme instructions of the International EPD® System. Version 4.0.
- Gervasio, Dimova, Pinto (2018). Benchmarking the Life-Cycle Environmental Performance of Buildings. Sustainability.
- ICDLI (2015). Technical characteristics and physical properties of HPL (Technical leaflet).
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- PCR 2019:14 Construction products, Version 1.3.2.