Environmental Product Declaration

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

HardStop® Decorative Protection Panels

By Formica Corporation

by Nemho, center of excellence for innovation and technology for Broadview Holding B.V.

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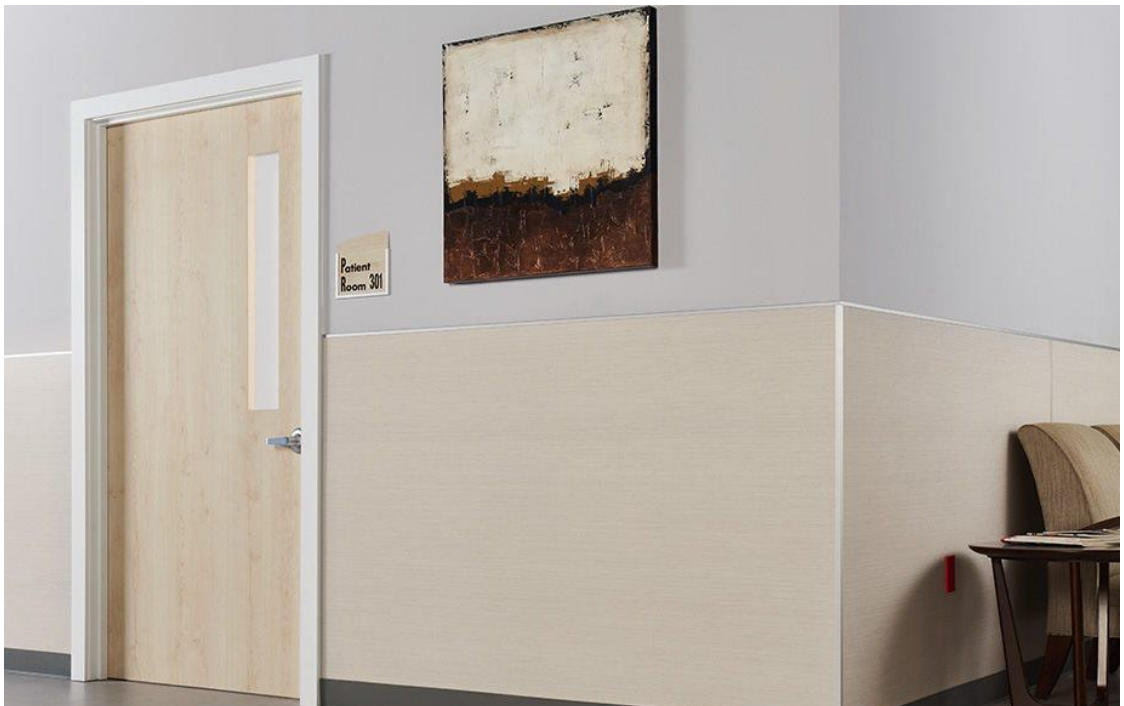
An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



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. Chair of the review is Claudia A. Peña. The review panel may be contacted via info@environdec.com
Life Cycle Assessment (LCA)
LCA accountability: David Sette, Nemho
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006 via: ☒ EPD verification by EPD Process Certification* Internal auditor: Lara Naested, Nemho Third-party verification: SGS Italia S.p.A. Via Caldera 21, 20153 Milano.(www.it.sgs.com) is an approved certification body accountable for third-party verification Third-party verifier is accredited by: *Accredia, certificate n.006H* *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: ☐ 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.

Company information

Owner of the EPD: Nemho, Wetering 20, 6002 SM Weert, The Netherlands.

Contact: s.corrado@nemho.com

Description of the organisation:
Nemho is the Innovation Centre of the material companies of the Broadview Holding, namely Arpa Industriale, Trespa International, Formica Group, Homapal, Westag AG and DOS. Nemho carries out all sustainability-related activities, including LCA studies, for the above-mentioned companies.

Description of the manufacturing company: 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). By the 1930s, the Formica Products Company had shifted away from industrial applications to decorative surfaces. 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-Richielieu, Quebec along with a network of distribution warehouses across the United States, Canada and Mexico.

Product-related or management system-related certifications: 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

Name and location of production site(s): Evendale (Ohio, US)

Product information

Product name: HardStop® Decorative Protection Panels by Formica Group.

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

Product description:
HardStop® Decorative Protection Panels are decorative high-pressure panels (high-pressure laminates, HPL). HPL products comprise individual layers of natural fibres, treated with thermosetting resins and pressed under high pressure. The panels are attributed with an integrated decorative layer on both side of the panels. The decorative layer consist either of a decor paper impregnated with thermosetting melamine resin or a dry printed decor paper with an impregnated overlay. The core layers consist in fiberglass treated with a slurry of thermosetting resin.

HardStop® Panels feature a treated fiberglass core for added durability, strength, and fire resistance. HardStop® Panels are Class A fire-rated. HardStop® Panels are intended for commercial applications. They can be used in the following applications, provided installation instructions are strictly followed:

- Walls/Partitions/Wainscoting
- Backsplash

UN CPC code: n.a.

LCA information

Declared unit: 1 square meter of finished panel, 0.075'' thick, weighing 3.793 kg, plus primary packaging. All the possible product décor layers, different for the color and for the finishing, are covered by this EPD.

Reference service life: not applicable
Time representativeness:
Data used for the LCA calculation refer to the production year 2021.

Database(s) and LCA software used: The LCA study was performed with the support of the Simapro LCA software (version 9.3) and Ecoinvent 3.8 ad Carbon Minds database
Description of system boundaries:
The system boundaries of this EPD are 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 HardStop® Decorative Protection Panels 0.075'', carried out in the plant of Formica located in Evendale, the production of raw materials, electricity, and natural gas.
The deconstruction of HardStop® Decorative Protection Panels 0.075'' (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 panel at the end of life is sent to incineration (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 5.05 MJ/kg as reported by laboratory measurements.

System diagram:

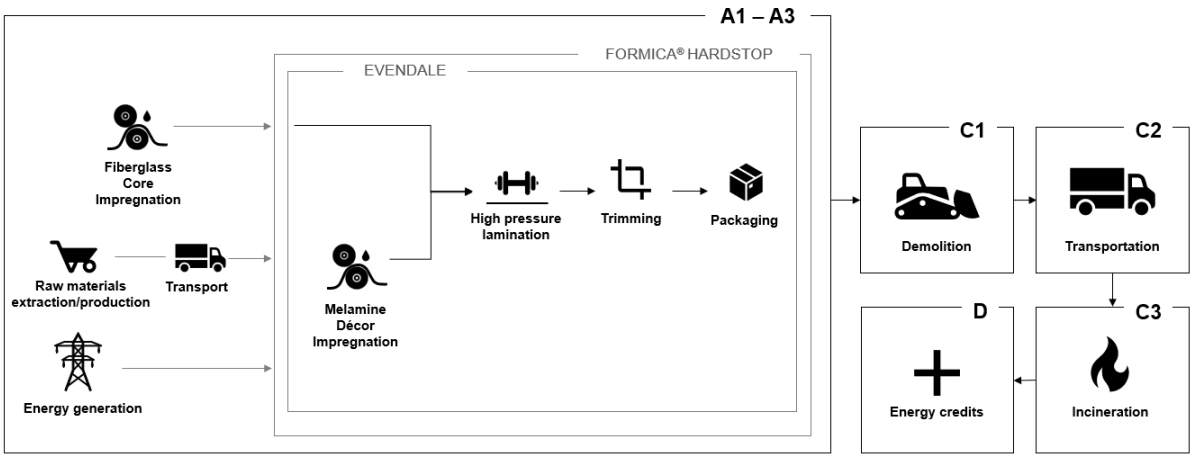


Figure 1: System boundary diagram for HardStop® Decorative Protection Panels.

More information:

Electricity modelling

A share (20.9%) of Formica Evendale electricity is purchased with Renewable Energy Certificates (RECs), which corresponds to 100% Hydroelectricity.

The remaining electricity for Formica Evendale is purchased as residual mix, which corresponds to 32.1% Coal, 30.7% Nuclear, 29.4% Gas, 4,8% Wind electricity, 1.1% Hydroelectricity, 0.8% Other fossil, 0,6% Biomass and 0.1% Other. Formica Evendale residual mix is modelled based on 2021 Green-e® Residual Mix for RFCW grid (RFC West/ Eastern Power Grid).

End of life scenario for Formica HardStop® Decorative Protection Panels:

HPL panels are commonly used as secondary material for energy recovery, therefore it is assumed that 100% of the HPL panel at the end of life are sent to incineration. Loads from material incineration and resulted energy credits (module D) are declared. Energy credits are calculated considering a lower heating value (LHV) of panels equal to 5.05 MJ/kg as reported by laboratory measurements.

Allocation approach

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

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	ND	ND	ND	ND	ND	ND	ND	ND	ND	GLO	GLO	GLO	GLO	GLO
Specific data used	>90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	Not relevant																

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	0.190 ± 0.004	0%	5.00 ± 0.1% and 0.043 ± 0.001 kg C/kg
Fiberglass	0.311 ± 0.006	0%	0% and 0 kg C/kg
Core slurry	3.083 ± 0.062	0%	0% and 0 kg C/kg
Melamine resins	0.209 ± 0.004	0%	0% and 0 kg C/kg
TOTAL	3.793 ± 0.076	0%	5.00 ± 0.1% and 0.043 ± 0.001 kg C/kg
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
Polycoat	0.017	0.46%	0.0%
TOTAL	0.017	0.46%	0.0%

HardStop® Decorative Protection Panels do 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 Information

Potential environmental impact – mandatory indicators according to EN 15804

Results per functional or declared unit							
Indicator	**Unit**	**Tot.A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	1.94E+01	2.40E-01	3.53E-02	7.46E+00	0.00E+00	-1.36E+00
GWP-biogenic	kg CO_2 eq.	1.65E-01	0.00E+00	0.00E+00	6.00E-01	0.00E+00	0.00E+00
GWP-luluc	kg CO_2 eq.	7.39E-03	4.39E-04	1.33E-05	3.01E-05	0.00E+00	-1.45E-03
GWP-total	kg CO_2 eq.	1.96E+01	2.40E-01	3.53E-02	8.06E+00	0.00E+00	-1.36E+00
ODP	kg CFC 11 eq.	2.45E-06	7.92E-09	8.01E-09	8.47E-09	0.00E+00	-1.14E-07
AP	mol H^+ eq.	9.18E-02	1.18E-03	1.80E-04	1.52E-03	0.00E+00	-4.32E-03
EP-freshwater	kg P eq.	5.00E-03	1.12E-04	2.57E-06	1.34E-05	0.00E+00	-3.66E-04
EP-marine	kg N eq.	1.87E-02	2.26E-04	6.08E-05	9.84E-04	0.00E+00	-8.50E-04
EP-terrestrial	mol N eq.	1.95E-01	2.26E-03	6.65E-04	7.92E-03	0.00E+00	-8.62E-03
POCP	kg NMVOC eq.	5.53E-02	6.10E-04	1.98E-04	1.91E-03	0.00E+00	-2.51E-03
ADP-minerals&metals*	kg Sb eq.	8.57E-05	3.12E-07	8.11E-08	2.85E-07	0.00E+00	-1.71E-06
ADP-fossil*	MJ	2.99E+02	3.12E+00	5.43E-01	1.05E+00	0.00E+00	-1.92E+01
WDP	m^3 eq.	7.59E+00	3.81E-02	2.08E-03	-8.87E-03	0.00E+00	-1.26E-01
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.*

Potential environmental impact – additional mandatory and voluntary indicators

Results per functional or declared unit							
Indicator	**Unit**	**Tot.A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	2.07E+01	2.36E-01	3.50E-02	7.46E+00	0.00E+00	-1.33E+00

Potential environmental impact – additional voluntary indicators. Results for North America calculated according to ISO 21930

Results per functional or declared unit							
Indicator	**Unit**	**Tot.A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP (ISO 21930)	kg CO2 eq.	1.92E+01	2.33E-01	3.49E-02	7.46E+00	0.00E+00	-1.31E+00
ODP (ISO 21930)	kg CFC-11 eq.	2.60E-06	9.45E-09	8.45E-09	8.92E-09	0.00E+00	-1.23E-07
EP (ISO 21930)	kg N eq	5.27E-02	8.73E-04	3.76E-05	1.74E-03	0.00E+00	-2.86E-03
AP (ISO 21930)	kg SO2 eq	7.69E-02	1.01E-03	1.59E-04	1.42E-03	0.00E+00	-3.70E-03
POCP (ISO 21930)	kg O_3 eq.	1.02E+00	1.27E-02	3.83E-03	4.56E-02	0.00E+00	-4.89E-02

Use of resources

Results per functional or declared unit							
Indicator	**Unit**	**Tot.A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1.12E+01	3.10E-01	4.51E-03	1.32E-02	0.00E+00	-1.01E+00
PERM	MJ	3.31E+01	4.81E-02	1.51E-03	7.34E-03	0.00E+00	-1.58E-01
PERT	MJ	4.43E+01	3.58E-01	6.02E-03	2.05E-02	0.00E+00	-1.17E+00
PENRE	MJ	2.74E+02	3.12E+00	5.44E-01	1.05E+00	0.00E+00	-1.92E+01
PENRM	MJ	2.48E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.99E+02	3.12E+00	5.44E-01	1.05E+00	0.00E+00	-1.92E+01
SM	kg	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
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

[1] 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.

FW	m^3	2.12E-01	1.74E-03	6.82E-05	1.66E-04	0.00E+00	-5.72E-03
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 production and output flows

Waste production

Results per functional or declared unit							
Indicator	**Unit**	**Tot.A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1.43E-01	1.14E-03	4.16E-05	6.37E-02	0.00E+00	-3.75E-03
Non-hazardous waste disposed	kg	6.81E+00	1.51E-02	5.03E-02	8.06E-02	0.00E+00	-5.38E-02
Radioactive waste disposed	kg	7.39E-04	9.69E-06	3.59E-06	1.44E-06	0.00E+00	-3.17E-05

Output flows

Results per functional or declared unit							
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	3.79E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	7.70E+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. (https://www.formica.com/en-us/campaigns/sustainability).

References

General Programme Instructions of the International EPD® System. Version 4.
PCR 2019:14. CONSTRUCTION PRODUCTS. VERSION 1.2.5
ICDLI (2015). Technical characteristics and physical properties of HPL (Technical leaflet).
LCA Background report for Formica HardStop® Decorative Protection Panels

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