Environmental Product Declaration

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

DecoMetal® Laminate (Alu 1mm)

Formica Group North America, Formica Asia

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

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

THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD VERIFIED

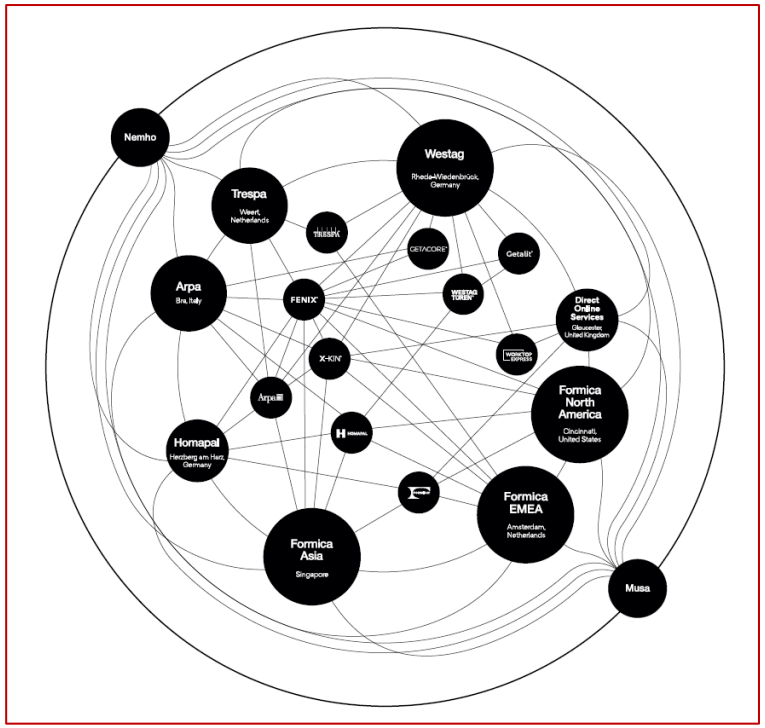
FORMICA AND HOMAPAL

Formica Group globally leads the industry in the design, manufacture, and distribution of innovative surfacing products for commercial and residential applications. Formica® Laminate is the 'original' and contains more than one hundred years of invention, innovation and design leadership.

Formica has companies all over the world, from Asia to North America, including Europe.

Formica is part of the Broadview Holding. Thanks to the synergies with its German sister company Homapal, global leader in the manufacturing of laminates with genuine metal surface, DecoMetal® Laminate was born. DecoMetal Laminate (Alu 1mm) is commercialized by Formica in Asian and North American countries.

Formica and Homapal are certified according to FSC (Forest Stewardship Council), MED (Marine Equipment Certification), GREENGUARD and GREENGUARD GOLD.



NEMHO

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).

DECOMETAL LAMINATE (ALU 1MM)

HPLs are decorative high-pressure panels. These products, in all their build-ups, are comprised of individual layers of natural fibres, treated with thermosetting resins and pressed under high pressure. The panels are attributed with an integrated decorative layer on one side and the backside is sanded.

PRODUCT DESCRIPTION

DecoMetal Laminate (Alu 1mm) is a decorative metal laminate with a surface material consisting of a thin aluminum layer. This aluminum layer is protected by a thin epoxy or anodised coating. The kraft paper core layers are impregnated with phenol-formaldehyde resin.

It consists of approx. 55% paper, 25% phenol-formaldehyde resin and 20% metal foil. The phenol-formaldehyde resin is irreversibly chemically cross-linked and forms a cured, stable material whose properties are fundamentally different to those of the raw materials.

DecoMetal® Laminate delivers lustrous color and sheen with textures reflecting energy, modernity and a feel for craftsmanship. Perfect for adding flair to vertical applications: walls, furniture, retail fixtures, signage, exhibits and displays.

PRODUCT IDENTIFICATION:

High pressure decorative thin panels with genuine metal surfaces, tested in accordance with European standard EN 438 part 2.

UN CPC CODE

Not Applicable

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METHODOLOGY

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

DECLARED UNIT

The declared unit is 1 square meter of finished panel, 1 mm thick, weighing 1.47 kg, plus primary packaging. All the possible product décor layers, different for the color and for the finishing, are covered by this EPD.

DecoMetal Laminate (Alu 1mm) is produced by Homapal at Herzberg am Harz (Germany) and is commercialized by Formica in the Asian and North American markets.

REFERENCE SERVICE LIFE

Not applicable.

TIME REPRESENTATIVENESS

Data used for the LCA calculation refer to the production year 2023.

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 10.0).

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

ELECTRICITY MODELLING

The electricity mix is modelled according to the residual German energy mix sourced from the Association of issuing bodies (AIB, 2021).

The German residual electricity mix consists of 20,8% nuclear energy and 79,2% fossil from coal (48,2%), gas (24,6%), oil (1,3%), other (5,1%).The emission factor of electricity, calculated using the GWP-GHG indicator, is 0,69 kgCO_{2eq}/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

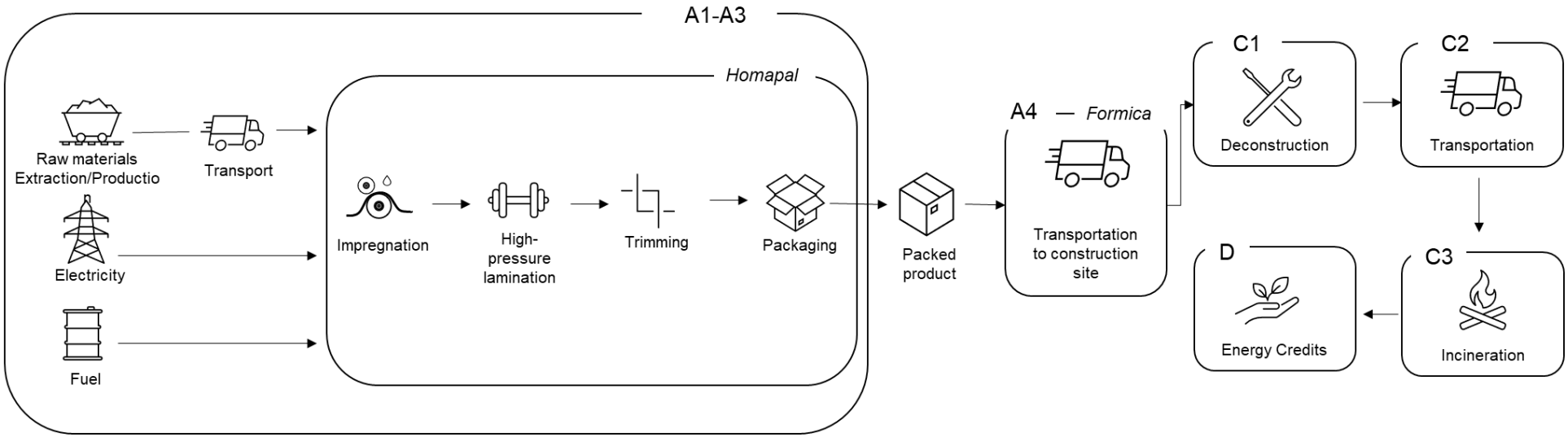
Mandatory potential impact indicators are calculated using the EN 15804 reference package based on EF 3.1.

SYSTEM BOUNDARIES

The system boundary of this EPD is from cradle to gate with modules A4, C1–C4 and module D (A1–A3 + A4 + C + D).

The product stage (modules A1-A3) includes the manufacturing process of DecoMetal, carried out in the plants of Herzberg am Harz, the production of raw materials, electricity, and natural gas. Module A4 consists in the transportation of DecoMetal Laminate (Alu 1mm) to the final customers in Asia and North America. It is modelled based on default data reported in the PEFCR guidance (EC, 2018).

The deconstruction of DecoMetal Laminate (Alu 1mm) (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	DE	Asia North America	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	n.a.			-	-	-	-	-	-	-	-	-	-	-	-	-	-

X: module declared, ND: module not declared, n.a: not applicable

CONTENT INFORMATION

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% of product	Biogenic material, kg C/m^2
Paper	0,792 ± 0,016	0%	53,9% ± 1,1%	0,286 ± 0,006
Phenolic Resin	0,37 ± 0,007	0%	0%	0%
Aluminum Foil	0,308 ± 0,006	0%	0%	0%
TOTAL	1,47 ± 0,029	0%	53,9% ± 1,1%	0,286 ± 0,006

Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/m^2
HDF panels	0,038	2,6%	0,02
Cardboard boxes	0,005	0,4%	0,00
PE foil and tape	0,001	0,1%	0,00
TOTAL	**0,045**	**3,1%**	**0,02**

The biogenic carbon content of the product and packaging is respectively 1,05 kgCO2eq/m^2 and 0,07 kgCO2eq/m^2.

DecoMetal Laminate (Alu 1mm) 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 at date of issuing of this EPD.

ENVIRONMENTAL PERFORMANCE

POTENTIAL ENVIRONMENTAL IMPACT – MANDATORY INDICATORS ACCORDING TO EN 15804

Results for 1 m² of DecoMetal Laminate (Alu 1mm)								
Indicator	**Unit**	**Tot.A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
Climate change – total	kg CO_2 eq.	7,63E+00	3,73E-01	9,34E-02	1,52E-02	2,07E+00	0,00E+00	-1,56E+00
Climate change - fossil	kg CO_2 eq.	8,65E+00	3,73E-01	9,30E-02	1,52E-02	1,01E+00	0,00E+00	-1,56E+00
Climate change – biogenic	kg CO_2 eq.	-1,04E+00	1,20E-04	1,94E-04	4,93E-06	1,05E+00	0,00E+00	-1,94E-03
Climate change – land use and land use change	kg CO_2 eq.	1,43E-02	2,15E-04	1,94E-04	7,18E-06	3,02E-05	0,00E+00	-1,93E-03
Ozone depletion	kg CFC 11 eq.	4,16E-07	6,54E-09	6,03E-10	3,34E-10	2,44E-09	0,00E+00	-1,88E-08
Acidification	mol H^+ eq.	3,66E-02	2,49E-03	4,51E-04	6,25E-05	5,21E-04	0,00E+00	-4,83E-03
Eutrophication aquatic freshwater	kg P eq.	2,55E-04	3,49E-06	4,69E-06	1,23E-07	7,73E-07	0,00E+00	-4,65E-05
Eutrophication aquatic marine	kg N eq.	7,42E-03	8,49E-04	8,18E-05	2,37E-05	2,41E-04	0,00E+00	-9,36E-04
Eutrophication terrestrial	mol N eq.	8,10E-02	9,24E-03	9,10E-04	2,55E-04	2,47E-03	0,00E+00	-1,04E-02
Photochemical ozone formation	kg NMVOC eq.	2,80E-02	2,97E-03	2,70E-04	9,56E-05	6,34E-04	0,00E+00	-3,83E-03
Depletion of abiotic resources - minerals and metals*	kg Sb eq.	1,73E-05	1,25E-06	8,46E-08	4,12E-08	1,50E-07	0,00E+00	-1,47E-06
Depletion of abiotic resources - fossil fuels*	MJ	1,17E+02	5,23E+00	1,20E+00	2,23E-01	5,64E-01	0,00E+00	-2,10E+01
Water use*	m^3 eq.	1,20E+00	2,34E-02	1,56E-02	1,07E-03	8,87E-03	0,00E+00	-1,61E-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 for 1 m² of DecoMetal Laminate (Alu 1mm)								
Indicator	**Unit**	**Tot.A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG**	kg CO2 eq.	8,67E+00	3,73E-01	9,34E-02	1,52E-02	1,02E+00	0,00E+00	-1,56E+00

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

Results for 1 m² of DecoMetal Laminate (Alu 1mm)								
Indicator	**Unit**	**Tot.A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
Climate change – GWP 100 (ISO 21930)	kg CO2 eq.	8,67E+00	3,73E-01	9,34E-02	1,52E-02	1,02E+00	0,00E+00	-1,56E+00
Ozone depletion - ODP (ISO 21930)	kg CFC-11 eq.	4,52E-07	7,15E-09	1,07E-09	3,60E-10	2,59E-09	0,00E+00	-2,40E-08
Eutrophication potential - EP (ISO 21930)	kg N eq	3,96E-03	1,61E-04	4,46E-05	5,08E-06	1,15E-04	0,00E+00	-4,63E-04
Acidification potential - AP (ISO 21930)	kg SO2 eq	3,18E-02	2,21E-03	3,90E-04	5,63E-05	4,82E-04	0,00E+00	-4,18E-03
Photochemical ozone formation potential – POCP (ISO 21930)	kg O3 eq.	4,48E-01	5,32E-02	5,16E-03	1,47E-03	1,42E-02	0,00E+00	-5,91E-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 m² of DecoMetal Laminate (Alu 1mm)								
Indicator	**Unit**	**Tot.A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE)***	MJ	3,51E+01	7,85E-02	1,47E-01	3,27E-03	0,00E+00	0,00E+00	-1,44E+00
Use of renewable primary energy resources used as raw materials (PERM)***	MJ	9,30E+00	0,00E+00	0,00E+00	0,00E+00	-5,58E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (PERT)***	MJ	4,44E+01	7,85E-02	1,47E-01	3,27E-03	-5,58E+00	0,00E+00	-1,44E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE)***	MJ	1,09E+02	5,23E+00	1,20E+00	2,23E-01	0,00E+00	0,00E+00	-2,10E+01
Use of non-renewable primary energy resources used as raw materials (PENRM)***	MJ	8,89E+00	0,00E+00	0,00E+00	0,00E+00	-5,33E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy re-sources (PENRT)***	MJ	1,17E+02	5,23E+00	1,20E+00	2,23E-01	-5,33E+00	0,00E+00	-2,10E+01
Use of secondary material (SM)	kg	0,00E+00	0,00E+00	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	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	0,00E+00
Use of net fresh water (FW)	m^3	7,01E-02	7,60E-04	6,44E-04	3,50E-05	4,14E-04	0,00E+00	-6,49E-03

*** *Primary energy use indicators are calculated following option B described in Annex 3 of PCR for Construction products v 1.3.1.*

WASTE PRODUCTION

Results for 1 m² of DecoMetal Laminate (Alu 1mm)							
Indicator	**Unit**	**Tot.A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1,93E-02	1,35E-04	3,79E-05	6,22E-06	4,85E-01	0,00E+00
Non-hazardous waste disposed	kg	1,19E+00	2,80E-01	5,51E-03	1,96E-02	1,50E-01	0,00E+00
Radioactive waste disposed	kg	1,86E-04	1,35E-06	3,25E-06	6,81E-08	5,74E-07	0,00E+00

OUTPUT FLOWS

Results for 1 m² of DecoMetal Laminate (Alu 1mm)							
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	1,65E-01	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	0,00E+00	4,41E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,88E+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 papers available online, respectively for Formica North America, Formica Asia, and Homapal.

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PROGRAM 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

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 1.3.2
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 info@environdec.com
Life Cycle Assessment (LCA)
LCA accountability: Sara Corrado, 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.0005VV* *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.

REFERENCES

- European Commission (EC). PEFCR Guidance document, - Guidance for the 13 development of Product Environmental Footprint Category Rules (PEFCRs), version 6.3.
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