CARBON FOOTPRINT METHODOLOGY REPORT FENIX®

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Contents

1. General information

This study and report have been performed by Nemho - the group R&D center of Trespa International, Arpa Industriale (from now on referred as Arpa), Formica, Homapal and Westag – and refers to FENIX®, a laminate manufactured by Arpa and Formica.
The study, certified in 2021 by SGS, has been carried out following the EN 15804:2012+A2:2019 standard, the PCR 2019:14 Construction Products And Construction Services (Version 1.11) and the ISO 14067: 2018.

2. Product carbon footprint definition

The carbon footprint of a product (CFP) is the sum of greenhouse gases (GHGs) emissions and removals in a product system expressed as CO2 equivalents and based in a life cycle assessment. GHGs are the gaseous constituent of the atmosphere that absorbs and emits radiation within the spectrum of infrared radiation.
The following groups of GHGs have been considered in this study: carbon dioxide (CO2), methane (CH4), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF6), and perfluorocarbons (PFCs).

3. Goal of the study

The overall goal of this CPF study is to calculate the potential contribution of Fenix panels to global warming expressed as CO2e by quantifying all significant GHG emissions and removals over selected life cycle stages (as specified in paragraph 4.3).

4. Scope of the study

The following sections describe the general scope of the project to achieve the stated goals. This includes, but is not limited to, the product function, functional unit, the system boundary, allocation procedures, and cut-off criteria of the study.

4.1. Product description

FENIX® panels 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 one or both sides of the panels. In case of a one-sided décor layer, the backside is sanded.
FENIX® panels are available in a wide colour range and thicknesses.
The most relevant technical information applicable to all FENIX® products are listed in Table 1. Assessment rules are given in European standard EN 438, various parts.

Table 1. Relevant technical information for all FENIX® products

Properties	Unit	Values
Physical properties		
Spots, dirt and similar surface defects	mm2/m2	≤ 1
Fibres, hair and scratches	mm/m2	≤ 10
Physical properties		
Density	g/cm3	≥ 1,35
Resistance to surface wear	Revolutions	≥ 200
Resistance to scratching	Rating	≥ 4
Flexural Modulus (only for solid)	Mpa	≥ 9000
Flexural strength (only for solid)	Mpa	≥ 80
Light fastness (Xenon-arc)	Grey scale rating	≥ 4
Thickness tolerance	mm	± 0,10 for thickness 0,5 ≤ t ≤ 1,0 ± 0,15 for thickness 1,0 < t < 2,0 Depending on thickness for solid panels
Length and width tolerance	Mm	+ 10 / - 0

Release of formaldehyde Class E1 according to EN 13986.

4.2. Functional unit

In accordance to the PCR the functional unit (FU) is 1 m² of product.
FENIX® panels are manufactured in three different locations: Bra (Italy); St. Jean (Canada) and Rheda-Wiedenbrück (Germany).

4.3. System boundaries

The scope of the study includes raw material sourcing and extraction, manufacturing, and end-of-life (EOL) disposal of panels, along with a credit for incineration. The declared modules are summarized in Table 2.

Table 2. System boundaries

	Module	Declared / not declared[1]
A1 - A3	Raw materials production and transportation. Product manufacturing and packaging	Declared
A4 – A5	Transport, construction and installation	Not declared
B1 – B7	Use, maintenance, repair, replacement, refurbishment, operational energy use, operational water use	Not declared
C1	Deconstruction	Declared
C2, C3 or C4	Transport to EOL, waste processing	Declared
D	Energy recovery credits	Declared (not included in the system boundaries)

4.4. Geographical scope

FENIX® panels are manufactured in Italy, Germany and Canada and mainly sold in Europe (89% of volume). Smaller shares of product's volumes are sold in Asia, and the U.S., respectively 8 and 3%[2] . The picture below summarizes the geographical scope of the investigated system.

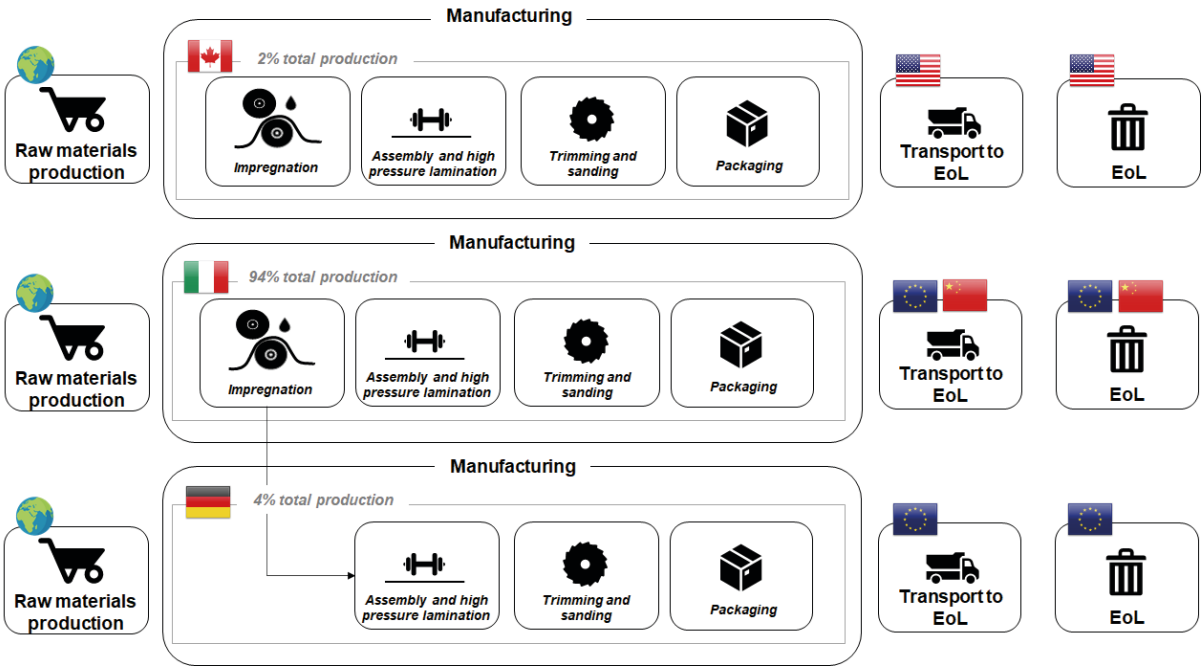

Figure 1. Geographical scope of the system under study

1 in compliance with the EN 15804:2012+A2:2019 standard and the PCR 2019:14 Construction Products And Construction Services (Version 1.11)
2 Sales data refer to year 2020.

4.5. Time boundary

Data refer to production year 2020. Inter annual variability might occur due to the implementation of energy efficiency plans. However, as no major changes in the technology or the manufacturing process can be assumed in the next five years, this time period can be reasonably considered as representative for the study.

4.6. Cut-off criteria

In the assessment, all available data from production process are considered, i.e. all raw materials used, thermal energy, and electric power consumption using best available datasets. Thus material and energy flows contributing less than 1% of mass or energy are considered.
No cut-off criteria are applied in this study.

5. EOL modelling

The deconstruction of FENIX® products (module C1) is modelled according to Gervasio et al. (2018). The transport at the end of life (module C2) assumed an average transport distance equal to 100km. FENIX® boards are commonly used as secondary material for energy recovery in Europe and Asia (C3), whilst landfilling (C4) prevails in the U.S.
It is assumed that 70%of post-consumer HPL boards waste reaches the end-of-waste in light of their high inferior calorific value (on average 19 MJ/kg according to the association of the European HPL industry, ICDLI).
The following assumptions have been made:

- In Europe: 70% of post-consumer HPL boards is combusted in an European waste incinera tion plant, while the remaining is landfilled[3] . A distance of 100 km is assumed from decon struction to the waste management facility.
- In Asia: same assumptions as above.
- In the U.S.: is 100% landfilled in a sanitary landfill facility. A distance of 100 km is assumed from deconstruction to the waste management facility.

Energy credits are declared in module D but not included in the system boundaries. The energy substitution for thermal and electrical energies are calculated with the Ecoinvent database by considering the HPL lower calorific value of 19 MJ/kg. Efficiencies are assumed to be 60%.

6. Electricity and gas emissions

Electricity
The GHG emissions associated with the use of electricity include:

- GHG emissions arising from the life cycle of the electricity supply system (source: Ecoinvent 3.6);
- GHG emissions during the generation of electricity including losses occurring during tran smission and distribution (source: Ecoinvent 3.6);
- Downstream emissions (source: Ecoinvent 3.6).

3 The share of incinerated panels is based on the figures about the share of recovered plastic waste provided by Plastics Europe.

When electricity is generated internally and consumed for FENIX® (25% approximately of the electricity required by the Italian facility), life cycle data for such electricity were used (see paragraph 5.7). Supplier-specific life cycle data were used when the electricity is assured with a unique claim (i.e. in the factory in Bra) instead of electricity from residual mix.

Natural gas

The GHG emissions associated with the use of natural gas include:

- GHG emissions arising from production and transportation (source: Ecoinvent 3.6);
- GHG emissions generated during combustion (source: ISPRA, 2020).

References

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