Business Assurance Services

CERTIFICATE OF VERIFICATION

CRITICAL REVIEW

DEKRA Assurance Service GmbH hereby confirms that a critical review and validation has been carried out for the Life Cycle Assessment (LCA) calculation process at UPM Raflatac '**Label Life**' developed by:

UPM Raflatac Oy
Tesomankatu 31,
33310 Tampere,
Finland

It can be confirmed that the LCA calculation tool is generated in a professional manner and the accompanying documents are well-structured. The validated process for generating Life Cycle Impact Assessment (LCIA) results is appropriate in relation to the goal of the process and covers sufficient quality checks.

The audit is based on the documents described precisely in the full validation report.

The documents and files of Label Life version 3.0 are validated in 2023. The following aspects were part of the critical review and validation process:

- the methods used to carry out the algorithms in the LCA software tool for calculating a Life Cycle Assessment (LCA) are consistent with the relevant International Standards (ISO 14040, ISO 14044 and ISO 14067),
- the methods and inventory modelling applied in the tool to carry out the LCA are scientifically and technically valid and follow methodological approaches triggered by PEF/EN 15804,
- the documentation referring to the software tool and the process description is transparent and consistent, traceable and allows full reproducibility,
- the process for generating LCIA results covers sufficient and resilient quality checks for input data as well as for the results themselves.

Further details can be found in the validation report dated July 2023 and the critical review statement dated 06th June 2024 (P120327017) that provide a detailed overview of the critical review and validation processes.

This certificate 990624115 is valid for Label Life version 3.0. Future software versions and changes in the process descriptions influence the validity as described in the validated documents.

The certificate is valid until 05th June 2027.

DEKRA does not approve and is not responsible for data filled in by UPM Raflatac. The verification of the specific Life Cycle Inventory (LCI) model generated by users of the tool is outside the scope of this validation process.

Stuttgart, 10.06.2024

i.A.
DEKRA Assurance Services GmbH
Malte Emmling – Project Manager Product Sustainability

Certificate-ID: 990624115

i.V.
DEKRA Assurance Services GmbH
Peter Paul Ruschin - Head of Sustainability Services

DEKRA Assurance Services GmbH – Handwerkstraße 15 – 70565 Stuttgart – Germany

UPM Raflatac Product Passport Prototype: Basic environmental declaration

Declaration created with Label Life Version 3.2 based on product data from 07 Jan 2025.
Declaration created by: UPM Raflatac Sustainability
Contact us at Send an inquiry | UPM Raflatac

1 Basic information

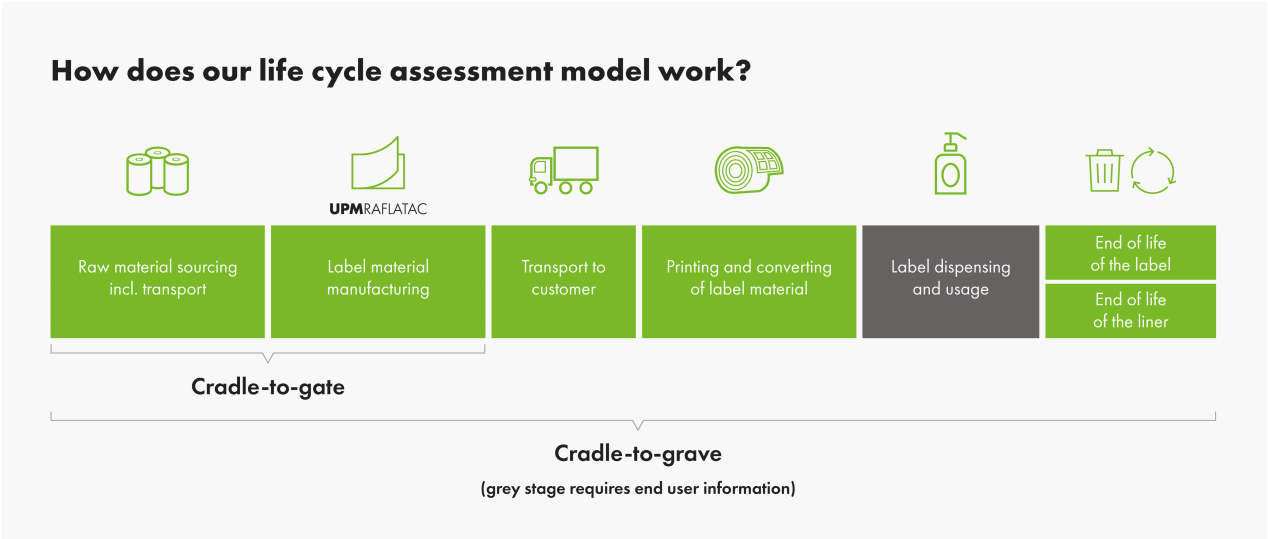
For product details please search our database for the relevant technical information sheet (TIS).
EAN code: 6415787208480
Product name: MACH COAT PLUS NXT+FSC / PERMANENT / KRAFT 83-FSC / SOLID UNPRINTED
Sales code: HWK/94-A/HWV/W0
Region: EMEIA
Product mass per declared unit (calculated as sum of components): 179 kg/1000 m^2

	Face	Liner
Mass per declared unit [kg/1000 m^2]	80	83
Recycled content* [%]	0	0
Plastics recycled via	Not applicable	Not applicable
Biobased plastic content [%]	0	0
Mass balance approach applied?	Not applicable	No

*Recycled content materials are identified in the technical information sheets (TIS). If no information is given in the technical information sheet by name, description or other details, the product is made from virgin material. In case of plastics, recycled content may derive from post-consumer or post-industrial sources, and this is specified in the TIS. FSC™ certified materials (FSC C012530) with FSC Mix claim may contain wood fibers from FSC certified forests, recycled materials or controlled wood, by definition. PEFC certified materials (PEFC/02-31-196) may contain PEFC certified fibers, recycled material or fibres from PEFC controlled sources. The share of recycled fiber content in the component can be considered negligible if the share is not informed separately in the technical information sheet.

2 Goal and scope

Declared unit: **1000m^2** pressure-sensitive labelstock
System boundaries: cradle-to-grave
End of Life approach & treatment of secondary materials: in line with the ‘polluter pays principle’ and ‘net scrap approach’ as described in the EN15804+A2. Inputs of secondary materials are treated based on the cut-off method. Potential benefits from end of life treatment are separated from impacts as "potential benefits".
Data quality: overall fair/good data quality (regional representativeness varies, see raw materials & energy).
Raw materials: secondary data from Sphera's MLC CUP2024.2, mainly EU-28 boundary conditions, complemented with primary data from selected suppliers.
Manufacturing (lamination process): primary data on energy consumption etc. with reference year 2023; sales region assumed to be region of manufacturing with applicable energy grid mix (RER for EMEIA, CN for APAC, USA for Americas).
Printing: secondary data.
Transportation: transport to customer based on maximum distance approach per sales region.
End of life: 100% incineration.
Software and Databases: LCA for Experts 10.9.0.20 and MLC 2024.2 (Sphera)



3 Contribution analysis per life cycle stage

The following life cycle stages are shown below in more detail:
1 Cradle-to-gate: includes raw material manufacturing, transport of raw materials to UPM Raflatac, labelstock manufacturing and packaging at UPM Raflatac;
2 Transport to customer: transport by truck and boat based on region-specific distances;
3 Printing: includes energy and consumables, process & matrix losses incinerated without credits;
4 End of Life: 100% incineration without credits;
5 Potential benefits: energy credits resulting from End of Life treatment.

Please note that results in the sections 3.1 and 3.2 are rounded to the next integer, while figures in section 3.3 are shown as scientific notation due to the differences in the indicators ranges.

3.1 Key indicators in Label Life

Label Life focuses on carbon (global warming potential, GWP), energy (primary energy demand, PED) and blue water consumption. These are summarized in the table below. PED is further broken down into renewable and non-renewable resources, for a more meaningful interpretation.

Label Life indicators per 1000m^2 labelstock

	1 Cradle to gate	2 Transp to customer	3 Printing	4 End of Life	5 Potential benefits
GWP (incl. biogenic C) [kg CO2 eq.]	78	38	95	233	-91
GWP (excl. biogenic C, incl LUC) [kg CO2 eq.]	304	39	55	40	-91
Blue water consumption [kg]	1,991	46	536	659	-417
Primary energy demand (PED) [MJ]	11,254	540	1,533	113	-2,157
PED, non renewable resources [MJ]	5,321	500	1,056	91	-1,614
PED, renewable resources [MJ]	5,934	41	478	22	-544

Key: *GWP - Global Warming Potential, IPCC AR6 GWP100; biogenic C - carbon sequestered during plant growth; LUC - Land use change; PED - Primary Energy Demand (net cal. value)*

When using the cradle-to-gate information only, it is important to note the biogenic carbon contained in the product (at gate, excluding packaging):
Expressed as carbon dioxide this is approx. 217kg CO_2 eq. per 1000m^2 PSL.
Expressed as a ratio this is approx. 0.331kg carbon per kg product.

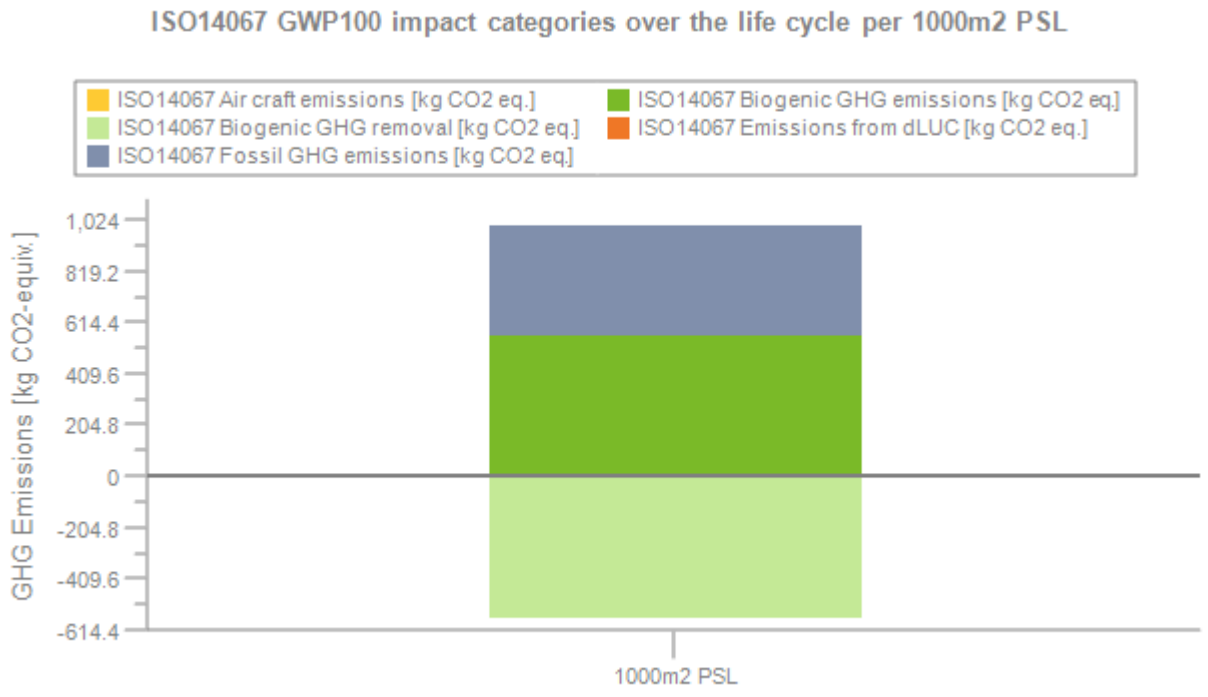
3.2 Indicators required by ISO 14067 for carbon footprint declarations

The total Global Warming Potential of life cycle stages 1-4 (excluding end of life credits), including all five categories of the ISO14067 GWP 100 indicators sum up to **445 kg CO_2 eq**. Details are provided in the table below. Biogenic Greenhouse Gas (GHG) removals are negative emissions and are therefore deducted from the other 4 impact categories. Biogenic Greenhouse Gas (GHG) removals include the carbon contained in the product (see section 3.1).

Impact categories shown per 1000m^2 labelstock

	1 Cradle to gate	2 Transp to customer	3 Printing	4 End of Life	5 Potential benefits
ISO14067 Air craft emissions [kg CO2 eq.]	0	0	0	0	0
ISO14067 Biogenic GHG emissions [kg CO2 eq.]	322	3	52	193	-12
ISO14067 Emissions from dLUC [kg CO2 eq.]	1	1	0	0	0
ISO14067 Fossil GHG emissions [kg CO2 eq.]	302	38	54	40	-90
ISO14067 Biogenic GHG removal [kg CO2 eq.]	-546	-3	-11	-1	12
ISO14067 Total GHG emissions [kg CO2 eq.]	78	39	95	233	-91

Key: *GHG - Greenhouse Gas; dLUC - direct Land use change*



Key: *GHG - Greenhouse Gas; dLUC - direct Land Use Change*

3.3 Indicators recommended by the Product Environmental Footprint Guide

Impact categories shown per 1000m² labelstock

	1 Cradle to gate	2 Transp to custom er	3 Printing	4 End of Life	5 Potenti al benefits
EF 3.1 Acidification [Mole of H+ eq.]	1.04E00	9.59E-02	9.89E-02	6.10E-02	-9.53E-02
EF 3.1 Climate Change - total [kg CO2 eq.]	3.04E02	3.87E01	5.50E01	4.01E01	-9.07E01
EF 3.1 Ecotoxicity, freshwater - total [CTUe]	2.39E03	3.68E02	4.15E02	4.78E01	-2.30E02
EF 3.1 Eutrophication, freshwater [kg P eq.]	6.09E-03	1.58E-04	2.17E-04	1.44E-05	-1.51E-04
EF 3.1 Eutrophication, marine [kg N eq.]	3.13E-01	2.69E-02	2.80E-02	2.20E-02	-2.90E-02
EF 3.1 Eutrophication, terrestrial [Mole of N eq.]	3.04E00	3.12E-01	3.14E-01	2.79E-01	-3.11E-01
EF 3.1 Human toxicity, cancer - total [CTUh]	1.26E-07	7.35E-09	1.61E-08	2.31E-09	-1.85E-08
EF 3.1 Human toxicity, non-cancer - total [CTUh]	7.18E-06	3.24E-07	4.34E-07	8.09E-08	-4.34E-07
EF 3.1 Ionising radiation, human health [kBq U235 eq.]	3.35E01	8.98E-02	1.65E01	5.57E-01	-1.98E01
EF 3.1 Land Use [Pt]	1.62E03	2.38E02	3.47E02	3.00E01	-3.18E02
EF 3.1 Ozone depletion [kg CFC-11 eq.]	1.10E-05	3.83E-12	6.70E-10	3.45E-11	-8.12E-10
EF 3.1 Particulate matter [Disease incidences]	1.26E-05	1.32E-06	7.98E-07	3.70E-07	-7.81E-07
EF 3.1 Photochemical ozone formation [kg NMVOC eq.]	9.57E-01	7.60E-02	7.90E-02	5.87E-02	-8.21E-02
EF 3.1 Resource use, fossils [MJ]	5.32E03	5.00E02	1.06E03	9.11E01	-1.61E03
EF 3.1 Resource use, mineral and metals [kg Sb eq.]	1.41E-03	3.17E-06	8.24E-06	4.59E-07	-7.89E-06
EF 3.1 Water use [m³ world equiv.]	7.31E01	5.52E-01	1.42E01	2.79E01	-9.95E00

Disclaimer: The results of environmental impact indicators EF 3.1 Water use, EF 3.1 Resource use, mineral and metals and all toxicity indicators shall be used with care as the uncertainties of these results are high, background data inconsistent or there is limited experience with the indicator.

4 References of used indicators

The Global Warming Potential indicators in Section 3.1, the indicators ISO14067 in section 3.2 and the Climate Change indicator in section 3.3 are all based on characterization factors for GWP 100 published in:

IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2391 pp. doi:10.1017/9781009157896

All indicators in section 3.3 rely on characterization factors published in the EF reference package 3.1 (transition phase) (last update July 2022) available here.

Blue water consumption and primary energy demand (net calorific value, renewable and non-renewable resources) are inventory level indicators and contain no characterisation factors.