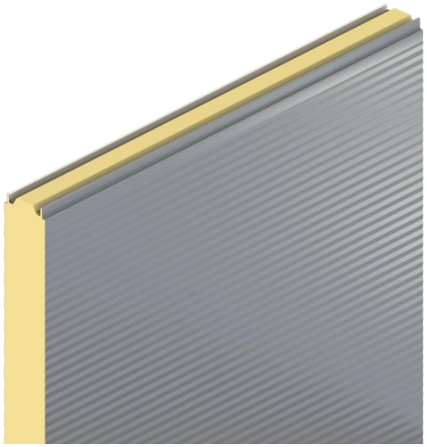


ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Kingspan wall and ceiling sandwich panels NC/NF with IPN core thickness 100mm

Kingspan A.S.



EPD HUB, HUB-6990

Published on 24.07.2026, last updated on 24.07.2026, valid until 23.07.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Kingspan A.S.
Address	465 Vážní, 50003, Hradec Králové, Czech Republic
Contact details	info@kingspan.cz
Website	www.kingspan.com

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Artur Krzywulski, Kingspan CEME
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Magaly Gonzalez Vazquez as an authorized verifier for EPD Hub

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	Kingspan wall and ceiling sandwich panels NC/NF with IPN core thickness 100mm
Additional labels	KS NC Wall and Ceiling Panel, KS NF Wall Panel, KS NR Roof Panel, Hoesch® Thermowand HF, ems Thermowand EF Wall Panel, ems Thermowand EC Wall and Ceiling Panel.
Product reference	-
Place(s) of raw material origin	EU
Place of production	Hradec Králové, 50003, 465 Vážní, Czech Republic,
Place(s) of installation and use	EU
Period for data	calendar year 2025
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	n/a
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	67,9

ENVIRONMENTAL DATA SUMMARY

Declared unit	1m2
Declared unit mass	12,45 kg
Mass of packaging	0,1761 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	35,7
GWP-total, A1-A3 ($kgCO_2e$)	35,7
Secondary material, inputs (%)	2,66
Total energy use, A1-A3 (kWh)	143
Net freshwater use, A1-A3 (m^3)	3,26

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Kingspan a.s. (Czech Republic) has been on the market since 1996 - and is a subsidiary of Kingspan Group, a global leader in manufacturing building products.
The Kingspan a.s. facility is located in the industrial park of Hradec Kralove. Kingspan a.s. specializes in the production of composite metal sandwich panels with both MW and PIR insulation cores, modular cold rooms and cold store doors. Moreover, Kingspan also offers a wide variety of ancillary products that supplement the building envelope. The manufacturing plant in Hradec Kralove produces insulated sandwich panels with IPN (isophenic) and mineral wool (MW) insulation core. The products are dedicated to external and internal wall & roof applications, and as well as ceiling elements. The high thermal insulation properties make the IPN core panels default solutions for controlled environment applications such as cold-rooms, chill stores, cold stores and ULO chambers. The panels produced in Hradec Kralove plant are mainly delivered to Germany, Czech Rep., Slovakia, Austria and Switzerland. More information about the manufacturer and the products can be found at https://www.kingspan.com/cz/cs .

PRODUCT DESCRIPTION

Kingspan steel-faced sandwich insulated panels with insulation core made from IPN foam cover a wide range of panel types such as wall, ceiling, facade and roof panels. The Kingspan IPN is a proprietary self-blended formulation which allows Kingspan to manage and control the chemistry and performance of the thermal insulation of composite panels. The IPN rigid insulation foam is a variant of Polyisocyanurate (PIR) rigid foam, engineered by Kingspan Panels to achieve exceptional performance of sandwich panels. The facings of Kingspan IPN sandwich panels are made from galvanized and organic coated carbon steel sheets according to EN 10346:2015. The thickness of steel sheets is defined by project specific requirements and varies between 0.4mm and 0.7mm. The panels are manufactured and certified according to European harmonized standard EN 14509:2013. The IPN core steel-faced sandwich panels are used as external and internal wall and ceiling elements, and as roof elements in industrial, commercial, residential and office buildings, hospitals, controlled temperature premises, clean rooms and in the food processing industry. The panels with IPN insulation core are available in thicknesses starting from 40mm up to 200mm. The products are also available in various modular widths - 1000 and 1150mm.
The subject of the current EPD evaluation are the IPN foam core panels thickness 100mm.

Further information can be found at: www.kingspan.com

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	68,13	EU
Minerals	0	-
Fossil materials	31,87	EU
Bio-based materials	0	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	**1m2**
Mass per declared unit	**12,45 kg**
Functional unit	**-**
Reference service life	**50 years**

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Not declared = ND.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

A market-based approach is used in modelling the electricity mix utilized in the factory.

Kingspan IPN sandwich panels covered by this environmental product declaration are manufactured in Hradec Králové in Czech Republic. The production of sandwich panels is carried out on continuous production line. All raw materials are transported to the manufacturing plant by road transport. The manufacturing of insulated panels starts with the de-coiling of the internal and external steel coils. The liners are rolled into the desired profiled pattern. The IPN core formulation in liquid form is then sprayed on to the internal liner and rises to meet the external liner, creating a rigid bond between the two steel sheets. The panels leaving the manufacturing line are stacked on EPS blocks (for forklift transport), covered with EPS sheets and distance blocks for safe transport. Finally, the whole bundle is wrapped with stretch foil.

The faces of IPN composite sandwich panel are made from hot-rolled galvanized and colour-coated steel sheets. The steel used in IPN panels is manufactured in European facilities and complies with relevant EU standards (EN 10346:2015 and EN 10169:2022). The standard grade of steel used in Kingspan sandwich panels is S280GD+Z275, there are other types possible depending on end use application. The steel sheets are coated with organic coatings according to EN 10169:2022. The type, thickness and colour of organic coating depend on final application environment and customer requirements.

The packaging of Kingspan IPN sandwich panels uses EPS blocks a base for bundle, then the bundle on top is covered with EPS sheets. For the side protection during transport and handling the additional EPD blocks are used at the sides and ends of bundle. Finally, the whole bundle is wrapped with PE stretch foil for protection against weather conditions.

The energy used for production of Kingspan IPN sandwich panels consist of renewable electricity (contracted from the grid Operator and from onsite roof-top PV power plant), heat used in lamination process comes from natural gas

boilers and heat from local municipal co-generation power plant. For the internal transport of goods there are used forklift trucks which are propelled either by LNG or by diesel.

The Kingspan IPN sandwich panels insulation core is an individually designed and developed polyisocyanurate (PIR) rigid foam. The IPN foam main components are isocyanate (MDI), Polyester polyol and foaming agents with the addition of further components and catalysts to achieve high levels of thermal, mechanical and fire performance. The IPN foam is HCFC free and contains no SVHCs (Substances of Very High Concern - according to REACH).

Manufacturing waste from panels production - steel scrap and IPN foam waste (spills and cutoffs) - are sorted and collected separately. Steel scrap in 95% goes to recycling, the remaining 5% goes for landfill (rates based on World Steel Association data). The IPN foam waste goes to municipal incineration.

The use of green energy in manufacturing is demonstrated through contractual instruments (GOs, RECs, etc.), and its use is ensured throughout the validity period of this EPD.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Packed sandwich panels are transported to the construction site by means of road transport. The transportation distance of 530km, considered in this study, represents the annual average distance from Hradec Kralove plant to various destinations across Europe. The insulated panels are made to order, specific to the building's requirements. Installation guides are available to assist the contractor with the correct installation of the product and any ancillaries. The installation scenario assumes steel fixings with an average weight consumption of 0.045kg/DU, and accessories made of steel coated sheets with an average consumption ratio of 0.45kg/DU. A conservative estimate of power necessary for installation works assumes electricity for a power tool (0.37kWh/DU) and diesel (10.53MJ/DU) for site handling. Installation losses are estimated at 2% and, as well as packaging, are included as installation waste.

The installation waste consists of steel scrap (panel's sheets) where 95% goes for recycling, and 5% goes to landfill (rates based on World Steel Association data), IPN foam waste together with the plastic packaging waste (mix of PE and EPS) goes for municipal incineration.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase. Air, soil, and water impacts during the use phase have not been studied.

The reference service life of 50 years is given as only additional information and is based on similar EPD's issued for sandwich panels with similar material specification and production technology.

PRODUCT END OF LIFE (C1-C4, D)

The end-of-life scenario for IPN sandwich panels consider demounting the sandwich panels from the building structure, transport to a reclamation facility, separation of steel facings and IPN insulation core. For removal of the panels(C1), a conservative estimate of electricity for a power tool (0,37kWh/DU) and diesel (3,81MJ/DU) for a crane has been made (the same as for installation phase). All generated waste is collected and transported to waste treatment facilities located within the country of installation, with an assumed transport distance of 60 km for landfill and municipal incineration, and 200km for steel recycling, all by means of road transport (C2).

The end-of-life scenario assumes that 95% of the steel components are collected and recycled (C3) through conventional routes (e.g. shredding, sorting and

remelting), while the remaining 5% are disposed of via landfill (C4). The recycling rates for steel are based on data from the World Steel Association (2024). The recycling processes include transport to recycling facilities, material preparation and remelting, which are accounted for as environmental loads in module D.

For the PIR insulation core, it is assumed that 65% is treated by municipal waste incineration with energy recovery, while the remaining 35% is landfilled without energy recovery (Plastics Europe LCA study, 2019). The incineration process includes transport to the facility and thermal treatment, generating electricity and/or heat which substitutes conventional energy production.
The selected end of life scenario is currently in use (year 2025) and represents one of the most likely and commonly applied approaches for similar products across the EU territory.

Module D includes the potential environmental loads and benefits arising from material and energy recovery processes beyond the system boundary of the product system. It considers the avoided production of primary steel, with associated potential benefits and loads from recycling reported accordingly. Additional benefits and impacts related to the incineration of IPN foam material as well as the packaging materials - (electricity and heat recovery) are also included. In the municipal waste incineration, recovered energy is assumed to substitute for average European electricity and thermal energy production.

All substituted processes and background data are modelled using Ecoinvent database v.3.12, with a reference year of 2025, representing current average European technological, recycling and energy system conditions.

ADDITIONAL INFORMATION

Kingspan steel-faced sandwich insulated panels with IPN insulation core are manufactured according to legally defined measures in the occupational health and safety regulations, which apply to the complete manufacturing process for sandwich panels. In collaboration with the external advisors, voluntary "health and safety" audits are carried out at regular intervals. The results of these inspections correspond to the official workplace guidelines.

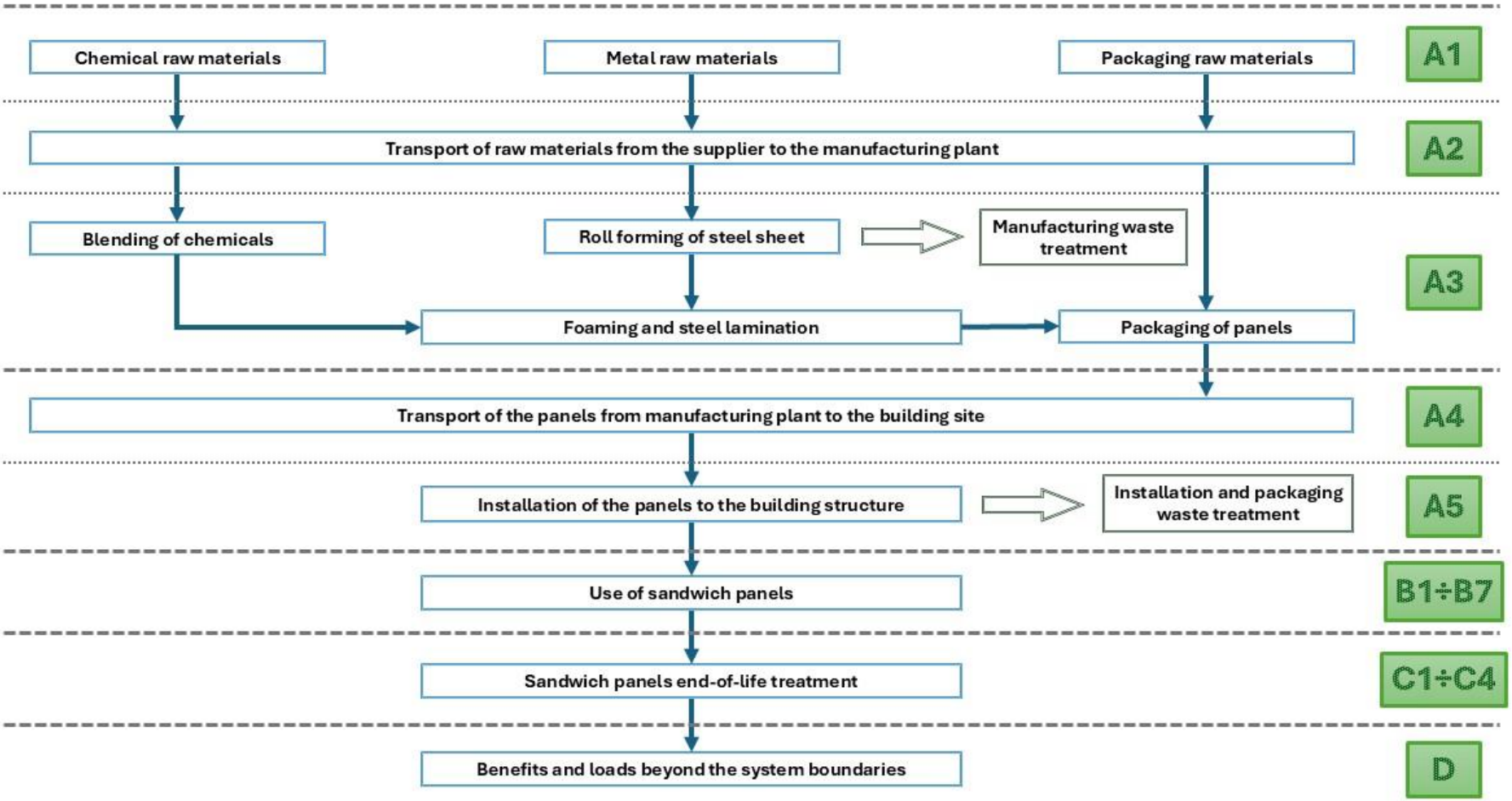
The panels are not harmful and do not emit any hazardous substances during their service life.

The Kingspan A.S. plant in Hradec Králové (CZ) is certified to ISO 9001, ISO 14001, ISO 37301, ISO 45001 and ISO 50001 management standards.

During the analyzed period of production, the content of recycled material, in key raw materials (steel and insulation core), based on mass balance method, was:

- For steel sheets – 17,55%
- For IPN® insulation foam – 0%.

LIFE CYCLE FLOW DIAGRAM



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

In the Life-Cycle assessment there were NOT excluded any processes.
Based on the Bill of Materials (BOM) - there are only excluded raw materials which share by mass is significantly below 1% - chemicals, tapes and gaskets.
The total mass of avoided components does not exceed 1% of the mass of the product.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging material	No allocation
Ancillary materials	No allocation
Manufacturing energy and waste	Physical Properties

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	No grouping
Grouping method	Not applicable
Variation in GWP-fossil for A1-A3, %	n/a

This EPD is product and factory-specific and does not contain average calculations.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.5. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11/3.12 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11/3.12 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

- EN 14509:2013 - Self-supporting double skin metal faced insulating panels - Factory made products – Specification
- World Steel Association: "Guidance on methodologies for modelling reuse and remanufacture in LCA Studies", 2024: https://worldsteel.org/wp-content/uploads/Guidance-on-methodologies-for-modelling-reuse-and-remanufacture-in-LCA-Studies.pdf
- Plastics Europe: "Overview plastic waste from building & construction by polymer type and by recycling, energy recovery and disposal", 2019: https://plasticseurope.org/wp-content/uploads/2021/10/BC_Table.pdf
- FprEN 18159, Double skin metal faced insulating sandwich panels for roofing and cladding - Environmental Product Declarations - Product category rules complementary to EN 15804 for double skin metal faced insulating sandwich panels for roofing and cladding.

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	3,27E+01	1,48E+00	1,48E+00	3,57E+01	1,32E+00	4,03E+00	ND	ND	ND	ND	ND	ND	ND	4,47E-01	2,34E-01	7,20E+00	1,15E-02	-1,30E+01
GWP – fossil	kg CO_2e	3,28E+01	1,44E+00	1,47E+00	3,57E+01	1,32E+00	4,05E+00	ND	ND	ND	ND	ND	ND	ND	4,43E-01	2,33E-01	7,20E+00	1,15E-02	-1,30E+01
GWP – biogenic	kg CO_2e	-9,51E-02	1,12E-02	3,97E-03	-7,99E-02	3,13E-04	-2,63E-02	ND	ND	ND	ND	ND	ND	ND	3,88E-03	5,93E-05	-4,57E-03	3,64E-06	-3,69E-02
GWP – LULUC	kg CO_2e	1,42E-02	2,30E-02	1,03E-02	4,76E-02	5,95E-04	2,49E-03	ND	ND	ND	ND	ND	ND	ND	3,81E-04	1,03E-04	3,26E-04	6,54E-06	-1,31E-02
Ozone depletion pot.	kg CFC-$_{11}$e	2,61E-06	4,12E-08	3,02E-08	2,68E-06	1,92E-08	7,62E-08	ND	ND	ND	ND	ND	ND	ND	7,22E-09	3,41E-09	9,03E-09	3,36E-10	-4,98E-08
Acidification potential	mol H^+e	7,77E-02	4,65E-03	4,82E-03	8,72E-02	3,16E-03	1,64E-02	ND	ND	ND	ND	ND	ND	ND	3,54E-03	8,06E-04	8,45E-03	7,93E-05	-5,93E-02
EP-freshwater[2)]	kg Pe	2,02E-03	1,07E-04	8,51E-04	2,97E-03	1,44E-04	2,29E-04	ND	ND	ND	ND	ND	ND	ND	1,34E-04	2,51E-05	1,66E-04	1,01E-06	-4,80E-03
EP-marine	kg Ne	1,89E-02	1,77E-03	3,33E-03	2,40E-02	7,62E-04	6,29E-03	ND	ND	ND	ND	ND	ND	ND	1,44E-03	2,66E-04	5,21E-03	3,14E-05	-1,00E-02
EP-terrestrial	mol Ne	2,01E-01	1,72E-02	1,33E-02	2,32E-01	8,13E-03	6,63E-02	ND	ND	ND	ND	ND	ND	ND	1,55E-02	2,88E-03	3,84E-02	3,42E-04	-1,26E-01
POCP ("smog")[3)]	kg NMVOCe	6,48E-02	6,89E-03	4,67E-03	7,63E-02	4,41E-03	1,97E-02	ND	ND	ND	ND	ND	ND	ND	4,67E-03	1,18E-03	9,63E-03	1,24E-04	-3,63E-02
ADP-minerals & metals[4)]	kg Sbe	3,62E-04	5,23E-06	2,17E-06	3,69E-04	4,57E-06	4,98E-05	ND	ND	ND	ND	ND	ND	ND	1,82E-06	6,82E-07	1,44E-05	1,75E-08	6,83E-06
ADP-fossil resources	MJ	5,49E+02	2,06E+01	2,67E+01	5,97E+02	1,83E+01	4,69E+01	ND	ND	ND	ND	ND	ND	ND	6,79E+00	3,31E+00	6,66E+00	2,81E-01	-1,41E+02
Water use[5)]	m^3e depr.	-1,35E+01	1,26E-01	5,14E-01	-1,29E+01	9,65E-02	5,08E-02	ND	ND	ND	ND	ND	ND	ND	8,48E-02	1,91E-02	5,52E-01	1,24E-02	-2,85E-01

1) GWP = Global Warming Potential;

2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e;

3) POCP = Photochemical ozone formation;

4) ADP = Abiotic depletion potential;

5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	4,27E-07	1,25E-07	5,57E-08	6,07E-07	9,65E-08	2,98E-07	ND	ND	ND	ND	ND	ND	ND	8,35E-08	2,21E-08	5,52E-08	1,86E-09	-9,26E-07
Ionizing radiation[6]	kBq U235e	5,04E-01	2,18E-02	4,43E-01	9,69E-01	1,45E-02	1,05E-01	ND	ND	ND	ND	ND	ND	ND	7,17E-02	2,79E-03	1,28E-02	1,62E-04	-8,23E-01
Ecotoxicity (freshwater)	CTUe	1,24E+02	2,03E+01	7,79E+00	1,52E+02	4,17E+00	8,14E+00	ND	ND	ND	ND	ND	ND	ND	8,54E-01	6,94E-01	1,84E+01	3,51E-02	2,77E+01
Human toxicity, cancer	CTUh	6,52E-09	2,81E-10	9,62E-10	7,76E-09	2,10E-10	1,00E-09	ND	ND	ND	ND	ND	ND	ND	6,77E-11	3,66E-11	7,77E-10	2,01E-12	-6,13E-09
Human tox. non-cancer	CTUh	3,40E-07	1,41E-08	9,16E-09	3,63E-07	1,12E-08	1,48E-08	ND	ND	ND	ND	ND	ND	ND	2,59E-09	2,05E-09	3,25E-08	4,87E-11	5,30E-07
SQP[7]	-	1,88E+01	1,61E+01	3,01E+01	6,50E+01	1,10E+01	7,76E+00	ND	ND	ND	ND	ND	ND	ND	8,62E-01	3,14E+00	5,68E+00	5,54E-01	-3,63E+01

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator;
7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8]	MJ	2,43E+01	3,80E-01	9,83E+00	3,45E+01	2,59E-01	3,81E+00	ND	ND	ND	ND	ND	ND	ND	8,15E-01	4,65E-02	5,08E-01	2,62E-03	-1,27E+01
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	2,43E+01	3,80E-01	9,83E+00	3,45E+01	2,59E-01	3,81E+00	ND	ND	ND	ND	ND	ND	ND	8,15E-01	4,65E-02	5,08E-01	2,62E-03	-1,27E+01
Non-re. PER as energy	MJ	4,44E+02	2,08E+01	1,54E+01	4,81E+02	1,83E+01	3,66E+01	ND	ND	ND	ND	ND	ND	ND	6,79E+00	3,31E+00	-7,24E+01	-4,23E+01	-1,41E+02
Non-re. PER as material	MJ	1,09E+02	0,00E+00	3,59E+00	1,12E+02	0,00E+00	-7,02E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-6,84E+01	-3,68E+01	0,00E+00
Total use of non-re. PER	MJ	5,53E+02	2,08E+01	1,90E+01	5,93E+02	1,83E+01	2,96E+01	ND	ND	ND	ND	ND	ND	ND	6,79E+00	3,31E+00	-1,41E+02	-7,92E+01	-1,41E+02
Secondary materials	kg	3,32E-01	9,41E-03	3,73E-03	3,45E-01	8,17E-03	5,95E-02	ND	ND	ND	ND	ND	ND	ND	2,18E-03	1,39E-03	4,71E-03	6,98E-05	4,15E+00
Renew. secondary fuels	MJ	5,04E-05	1,24E-04	2,73E-03	2,90E-03	1,06E-04	8,63E-05	ND	ND	ND	ND	ND	ND	ND	9,05E-06	1,80E-05	1,97E-04	1,46E-06	-1,35E-03
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	7,87E-03	7,87E-03	0,00E+00	1,57E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	3,22E+00	3,66E-03	4,11E-02	3,26E+00	2,44E-03	7,51E-02	ND	ND	ND	ND	ND	ND	ND	1,98E-03	4,68E-04	1,11E-02	2,90E-04	-2,41E-01

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	2,86E-01	3,66E-02	5,11E-02	3,73E-01	1,28E-01	1,23E-01	ND	ND	ND	ND	ND	ND	ND	6,22E-02	2,12E-02	5,37E-01	9,12E-04	-9,56E-01
Non-hazardous waste	kg	5,51E+00	6,65E-01	1,69E+00	7,87E+00	1,68E+00	1,43E+00	ND	ND	ND	ND	ND	ND	ND	6,89E-01	4,03E-01	3,78E+00	1,85E+00	8,55E+01
Radioactive waste	kg	2,62E-03	5,35E-06	1,76E-05	2,64E-03	3,46E-06	5,09E-04	ND	ND	ND	ND	ND	ND	ND	1,80E-05	6,67E-07	3,14E-06	3,82E-08	-1,99E-04

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	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	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	6,20E-02	0,00E+00	2,63E-01	3,25E-01	0,00E+00	1,82E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	8,55E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	4,54E-03	0,00E+00	1,29E-01	1,34E-01	0,00E+00	2,58E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,01E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	3,00E+01	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,02E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,02E+01	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,99E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,99E+01	0,00E+00	0,00E+00

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	3,28E+01	1,47E+00	1,48E+00	3,58E+01	1,32E+00	4,06E+00	ND	ND	ND	ND	ND	ND	ND	4,43E-01	2,33E-01	7,20E+00	1,15E-02	-1,30E+01

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Diesel combusted in building machine, World, One Click LCA, 0.33 kgCO2e/kWh.
2. Heat and power co-generation, hard coal, Czech Republic, Ecoinvent, 0.0871 kgCO2e/MJ.
3. Market for liquefied petroleum gas, Europe Without Switzerland, Ecoinvent, 1.09 kgCO2e/kg
4. Market for heat, district or industrial, natural gas, Europe Without Switzerland, Ecoinvent, 0.0542 kgCO2e/MJ
5. Electricity, production mix photovoltaic, at plant, Czech Republic, BAFU, 0.0305 kgCO2e/kWh
6. Electricity, hydropower, at pumped storage power plant, Czech Republic, BAFU, 0.64 kgCO2e/kWh
7. Electricity, production mix photovoltaic, at plant, Czech Republic, BAFU, 0.0305 kgCO2e/kWh
8. Electricity, hydropower, at power plant, Czech Republic, BAFU, 0.0069 kgCO2e/kWh
9. Electricity mix, medium voltage, GO cancellations, Czech Republic, BAFU, 0.0385 kgCO2e/kWh.

Transport scenario documentation - A4 (Transport resources)

1. Market for transport, freight, lorry, 16-32 metric ton, diesel, EURO 6, 530.0 km

Transport to the building site (A4) - Scenario documentation

Scenario parameter	Value
Capacity utilization (including empty return) %	70
Bulk density of transported products	0,19
Volume capacity utilization factor	<1

Installation at the building site (A5) - Scenario documentation

Scenario parameter	Value
Energy: type and consumption (MJ or kWh)	Low voltage electricity for installation power tools - 0.37kWh/DU Diesel fuel for the site handling equipment - 10.53 MJ/DU
Water use (m^3)	"-"
Ancillary materials: type and mass (kg)	Steel fixings with an average weight consumption of 0.045kg/DU, (own evaluation) Flashings and profiles made of steel coated sheets with an average consumption ratio of 0.45kg/DU (own evaluation)
Waste materials: type and mass (kg)	Steel sheets from panels - 0.17kg/DU IPN insulation core from panels - 0.08kg/DU EPS packaging - 0.12kg/DU PE packaging (wrapping foil and protective films) - 0,06kg/DU
Waste materials: output routes	Steel sheets landfill - 0.01kg/DU Steel sheets recycling - 0.16kg/DU Municipal incineration of plastic waste mix (IPN, EPS PE) - 0.26kg/DU
Direct emissions (kg)	"-"

End of life (C1-C4) - Scenario documentation

Scenario information	Value
Collection process: collected separately (kg)	Steel waste - 8,99kg/DU IPN foam waste - 3,97kg/
Collection process: Mixed waste (kg)	"-"
Recovery: re-use (kg)	0
Recovery: recycling (kg)	8,54
Recovery: energy recovery (kg)	2,58
Disposal (kg)	1,84
Scenario assumptions e.g. transportation (mode, km) & other	Landfill - 60km, Incineration - 60km, Steel recycling - 200km.

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Magaly Gonzalez Vazquez as an authorized verifier for EPD Hub Limited
24.07.2026



VERIFIED ISO 14025

ANNEX I

CORE ENVIRONMENTAL IMPACT INDICATORS BY PRODUCT THICKNESS

Table No. 1										
Impact category		**Unit**	**A1-A2**	**A1-A3**	**A1-A3**	**A1-A3**	**A1-A3**	**A1-A3**	**A1-A3**	**A1-A3**
Product Thickness [mm]		**mm**	**40**	**60**	**80**	**100**	**120**	**150**	**170**	**200**
Product Weight [kg/m2]		**kg/m2**	**10,15**	**10,86**	**11,67**	**12,45**	**13,24**	**14,53**	**15,42**	**16,63**
EN 15804+A2, PEF	GWP – total	kg CO_2e	3,03E+01	3,13E+01	3,38E+01	3,57E+01	3,79E+01	4,13E+01	4,33E+01	4,52E+01
	GWP – fossil	kg CO_2e	3,03E+01	3,13E+01	3,38E+01	3,57E+01	3,80E+01	4,26E+01	4,46E+01	4,66E+01
	GWP – biogenic	kg CO_2e	-3,02E-02	-4,87E-02	-6,46E-02	-7,99E-02	-9,69E-02	-1,35E+00	-1,37E+00	-1,41E+00
	GWP – LULUC	kg CO_2e	3,79E-02	4,07E-02	4,44E-02	4,76E-02	5,10E-02	5,68E-02	5,95E-02	6,27E-02
	Ozone depletion pot,	kg CFC-11 eq.	8,96E-08	9,63E-08	2,18E-06	2,68E-06	3,18E-06	4,08E-06	4,68E-06	5,57E-06
	Acidification potential	mol H^+ eq.	7,55E-02	7,71E-02	8,27E-02	8,72E-02	9,23E-02	1,03E-01	1,07E-01	1,07E-01
	EP-freshwater	kg Pe	1,84E-03	2,18E-03	2,60E-03	2,97E-03	3,37E-03	3,43E-03	3,05E-03	1,30E-03
	EP-marine	kg N eq.	2,05E-02	2,11E-02	2,30E-02	2,40E-02	2,54E-02	2,95E-02	3,00E-02	3,26E-02
	EP-terrestrial	kg N eq.	2,00E-01	2,06E-01	2,20E-01	2,32E-01	2,45E-01	2,73E-01	2,83E-01	2,91E-01
	POCP (“smog”)	kg NMVOC eq.	6,45E-02	6,67E-02	7,20E-02	7,63E-02	8,12E-02	9,18E-02	9,55E-02	9,69E-02
	ADP-minerals & metals	kg Sb eq.	3,68E-04	3,65E-04	3,69E-04	3,69E-04	3,72E-04	3,79E-04	3,76E-04	3,74E-04
	ADP-fossil resources	MJ	4,20E+02	4,64E+02	5,34E+02	5,97E+02	6,63E+02	7,96E+02	8,65E+02	9,40E+02
	Water use	m^3 eq. Depr.	-3,17E+00	-6,50E+00	-9,75E+00	-1,29E+01	-1,61E+01	-2,16E+01	-2,54E+01	-3,28E+01

Table No. 2										
Impact category		**Unit**	**A - C**	**A - C**	**A - C**	**A - C**	**A - C**	**A - C**	**A - C**	**A - C**
Product Thickness [mm]		**mm**	**40**	**60**	**80**	**100**	**120**	**150**	**170**	**200**
Product Weight [kg/m2]		**kg/m2**	**10,15**	**10,86**	**11,67**	**12,45**	**13,24**	**14,53**	**15,42**	**16,63**
EN 15804+A2, PEF	GWP – total	kg CO_2e	3,92E+01	4,12E+01	4,53E+01	4,89E+01	5,28E+01	6,07E+01	6,46E+01	6,78E+01
	GWP – fossil	kg CO_2e	3,92E+01	4,13E+01	4,54E+01	4,90E+01	5,29E+01	6,08E+01	6,47E+01	6,79E+01
	GWP – biogenic	kg CO_2e	-5,74E-02	-7,57E-02	-9,15E-02	-1,07E-01	-1,23E-01	-1,50E-01	-1,70E-01	-2,09E-01
	GWP – LULUC	kg CO_2e	4,15E-02	4,43E-02	4,82E-02	5,15E-02	5,50E-02	6,12E-02	6,40E-02	6,72E-02
	Ozone depletion pot,	kg CFC-11 eq.	1,45E-07	1,54E-07	2,28E-06	2,80E-06	3,31E-06	4,23E-06	4,85E-06	5,76E-06
	Acidification potential	mol H^+ eq.	1,03E-01	1,06E-01	1,14E-01	1,20E-01	1,26E-01	1,40E-01	1,46E-01	1,48E-01
	EP-freshwater	kg Pe	2,47E-03	2,83E-03	3,27E-03	3,67E-03	4,10E-03	4,20E-03	3,83E-03	2,07E-03
	EP-marine	kg N eq.	3,15E-02	3,30E-02	3,60E-02	3,80E-02	4,05E-02	4,65E-02	4,82E-02	5,23E-02
	EP-terrestrial	kg N eq.	3,10E-01	3,22E-01	3,44E-01	3,64E-01	3,84E-01	4,26E-01	4,45E-01	4,63E-01
	POCP (“smog”)	kg NMVOC eq.	9,84E-02	1,02E-01	1,10E-01	1,16E-01	1,23E-01	1,38E-01	1,44E-01	1,48E-01
	ADP-minerals & metals	kg Sb eq.	4,38E-04	4,35E-04	4,40E-04	4,40E-04	4,44E-04	4,52E-04	4,50E-04	4,48E-04
	ADP-fossil resources	MJ	4,93E+02	5,39E+02	6,12E+02	6,79E+02	7,49E+02	8,90E+02	9,62E+02	1,04E+03
	Water use	m^3 eq. Depr.	-2,49E+00	-5,79E+00	-8,99E+00	-1,21E+01	-1,53E+01	-2,06E+01	-2,43E+01	-3,17E+01