Environmental Product Declaration

According to EN 15804 and ISO 14025

OSB 3 **Superfinish** ECO / OSB 3 SPRUCE **Superfinish** ECO

Registration number: 3031EPD-17-0633
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kronospan

1. General information

Manufacturing company	KRONOSPAN OSB, spol. s r.o. Registration No.: 269 363 64 VAT No.: CZ26936364
Production site	The document refers to KRONOSPAN OSB, spol. s r.o. products from Jihlava (Czech Republic)
Adress/Production site	Na hranici 2361/6 586 01 Jihlava Czech Republic
Statutory body	Ing. Sylva Krechlerova
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EPD Program	National Eco-labelling Program. For more information see www.cenia.cz
EPD Registration N°	3031EPD-17-0633
Date of publication	8. 1. 2018
EPD validity	5 years
Verification	An independent verification of the declaration was made, according to ISO 14025:2010. This verification was external and conducted by a third party, based on the PCR mentioned above (see information below).
PCR identification	EN 15804 Sustainability of construction works – Environmental product declarations (Core rules for the product category of construction products)
PCR review conducted by	CEN standard EN 15804 serves as the core PCR
Third-party verifier	Building Research Institute – Certification Company Ltd. Pražská 16, 102 21 Prague 10, Czech Republic
Accredited or approved by	Czech Accreditation Institute (CAI) Olšanská 54/3, 130 00 Prague 3, Czech Republic

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2. Product

2.1 Product description

Kronospan OSB (Oriented Strand Boards) Superfinish are wooden panels made from oriented wood strands connected by resin, in range of thickness 8–30 mm. OSB Superfinish is developed and manufactured entirely in compliance with the current demand of ecological living focused on organic materials. Selecting suitable wood and binder, OSB Superfinish meets high standards of not only environmental buildings. Strands are bound with a formaldehyde-free binder. Formaldehyde emissions are limited to the natural content of formaldehyde in solid wood (< 0.03 ppm).

Product characteristics:

- High durability and resistance
- High load-bearing capacity
- High performance material
- High stability

2.2 Application

- Load-bearing cladding of exterior walls or roofs
- Structural floor decking
- Sub- floors and base boards for flooring systems
- Internal non load-bearing cladding of walls and ceilings, partitions
- Attic conversions or extensions
- Framework for upholstered furniture
- Packaging
- Warehouse management (racks, fences, etc.)

2.3 Technical Data

Performance data of the product are in accordance with its Declaration of performance (DoP) and with respect to the Essential characteristics according to EN 13986 and EN 300. For more details on technical information, please see technical brochure Kronobuild.

Quality assurance according to EN 300 and EN 13986:2004+A1:2015 - type OSB 3. Reaction to fire classification acc. EN 13501-1: class D-s1, d0 for thicknesses above 12 mm and class D-s2,d0 for thicknesses 8-12 mm.

2.4 Delivery status

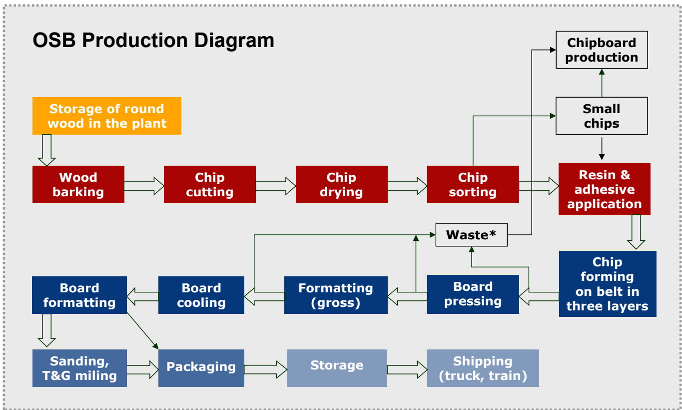
Standard formats:	2500 x 625 (1250) x thickness mm
Thickness (min–max):	8–30 mm
Width (min–max) :	625–2500 mm
Length (min–max):	2050–6200 mm
Edge profile:	S.E. (straight edges), T+G (tongue and groove)
Surface:	unsanded / sanded

2.5 Base materials / Ancillary materials

Product does not contain Substance of Very High Concern.

- Wood content is 95–98 % with dominant amount of spruce and pine. Product is according to standard PEFC ST 2002:2013 / TD CFCS 2002:2013.
- Binder (2–4 % of content) is PMDI - polymeric diphenylmethane diisocyanate binder used is generally reacted into polyuria and biurets, a small number of urethane and polyurete bonds may also be formed. This product does not liberate MDI vapor. MDI and pMDI are not classified as carcinogenic by ACGIH or IARC, they are not regulated as carcinogens by OSHA nor listed as carcinogens by NTP.
- Paraffin wax emulsion (1 %) is used as a water repellent.

2.7 Manufacture



* Quality wood, unsuitable for OSB production, cuttoffs and the like.

2.8 Environment and health during manufacturing

In face of the manufacturing conditions, no particular statutory or regulatory health protection measures are required.

Air form manufacturing is cleaned in accordance with statutory specifications. Emissions are significantly below the requisite limit values.

Production is free of waste water.

Waste wood products (bark etc.) are internally using for heat production and drying of inputs.

2.9 Product processing/Installation

It is not necessary to use special tools. Kronospan OSB 3 Superfinish boards can be cut, drilled or milled using conventional woodworking tools. Boards can be installed using known methods, standard tools and fasteners (nails, screws or staples).

When processing, standard safety measures must be taken. Protective googles, gloves and dust mask should be worn when sawing and grinding...

2.10 Packaging

Recyclable PE foils and tapes, iron clips and paper corners and labels are used for packing.

2.11 Condition of use

Material composition for the time of use complies with the base materials mentioned above.

2.12 Environment and health during use

No damage to health and environment can be anticipated if Kronospan OSB Superfinish is used as designated.

2.13 Reference service life

The service life of Kronospan OSB Superfinish depends on the area of application and is at least 50 years when used correctly.

2.14 Extraordinary effects

Fire

Building material class according to EN 13501-1:	D (normal flammable materials)
Smoke emission level:	s1, s2 (quantity/speed of emissions absent or weak / of average intensity)
Flaming droplets and/ or particles production:	d0 (no dripping)

Water (e.g flooding)

No heavy metals could be established in the quantitative analysis of inorganic trace substances in the material. No environmental consequences are to be anticipated.

OSB boards are not resistant to exposure to water. Damaged parts must be replaced.

Mechanical destruction

No environmental or health consequences are to be anticipated in the event of mechanical destruction.

2.15 Re-use phase

Provided they are untreated and undamaged, Kronospan OSB Superfinish can be easily segregated and re-used for the same application.

Segregated product can be recycled for chipboard production. In face of high heat value, energetic utilisation for generating process energy and electricity is possible.

2.16 Disposal

Waste key: EWC code 17 02 01 in accordance with the European Waste Catalogue.

2.17 Further information

Further information is available at http://cz.kronospan-express.com.

3. LCA calculation information

3.1 Declared Unit

The declared unit is one cubic metre (1 m³) of Kronospan OSB 3 Superfinish and OSB 3 SPRUCE Superfinish manufactured by production facility in Jihlava, Czech Republic.

3.2 System boundary

Type of EPD: cradle to grave, with options

The systems comprise the following stages in accordance with EN 15804:

Cradle to Grave Analysis taking into account all stages of the Life Cycle product. An EPD coverings A1 – C4 (D) life cycle stages. Module D is declared.

Description of the system boundry:

PRODUCT stage		
A1	Raw material supply	X
A2	Transport	X
A3	Manufacturing	X
CONSTRUCTION stage		
A4	Transport	X
A5	Construction-Installation process	X
USE stage		
B1	Use	X
B2	Maintenance	X
B3	Repair	X
B4	Replacement	X
B5	Refurbishment	X
B6	Operational energy use	X
B7	Operational water use	X
END OF LIFE stage		
C1	De-construction demolition	X
C2	Transport	X
C3	Waste processing	X
C4	Disposal	X
Benefits and loads beyond the system boundary		
D	Reuse-recovery	X

Description: X = included in the LCA, MND = Module Not Declared

Product stage, A1 - A3

This product stage is subdivided into 3 modules A1 (raw material supply), A2 (transport) and A3 (manufacturing). The aggregation of the modules A1, A2 and A3 is a possibility considered by the EN 15 804 standard. This rule is applied in this EPD.

Raw material supply – A1

This part takes into account the extraction and processing of all raw materials and energy which occurs upstream to the studied manufacturing process.

Specifically, the raw material supply covers sourcing (timbering) and production of binder and additives (e.g. paraffin emulsion).

Transport to manufacturer and internal transport – A2

The raw materials are transported to the manufacturing site. In this case, the modelling include road transportations (average values based on specific data) of each raw material. The internal transportation is included by part of electricity allocation.

Manufacture – A3

This module coverings manufacturing of products including cutting, drying, storing, mixing and packing.

The manufacturing process also collect data on the combustion of wooden waste, diesel and gasoline, related to the production process.

Use of electricity, fuels and auxiliary materials in the production is taken into account too. The environmental profile of these energy carriers is modeled for local conditions.

Packaging-related flows in the production process and all up-stream packaging are included in the manufacturing module, i.e. chipboard crossers, PE foils and tapes, iron clips and paper corners and labels (cradle-to-gate).

Construction process stage, A4 - A5

Transport – A4

This module includes transport from the production gate to the building site. Transport is calculated on the basis of specific data on 2016 and scenario with the parameters described in the following table.

Transport to the building site:

Parameter	Value per declared unit
Fuel type of vehicle or vehicle type used for transport	freight, lorry 16-32 metric ton, EURO4
Distance	470 km
Capacity utilisation (including empty returns)	100 % for tanker lorries 100 % of empty returns
Bulk density of transported products	0,555 - 0,615 t/m³
Volume capacity utilisation factor	1 (by default)

Construction installation process – A5

For the implementation of the product, handle electric screwdriver (850 W) and iron screws (5 x 70 mm) is supposed. The total amount of 700 screws and 0,51 kWh is supposed for DU (1 m³ of OSB with 20 mm thickness) installation.

During installation and construction, 5 % of the material amount is estimated to be wasted as cuttings. The losses are considered as materials for recycling. Within module A5, site-related packaging waste processing is included in the LCA.

It is assumed that packaging waste generated in the course of installation (chipboard crossers, PE foils and tapes, iron clips and paper corners and labels) is partly collected and recycled (50–85 %), partly collected and use for energy recovery (35 %) and partly landfilled (15 %). Wooden pallets are re-using and repairing if it is needed.

Installation in the building:

Parameter	Value per declared unit
Resource use	6,42 kg Iron screws /DU
Energy use	0,51 kWh electricity/DU
Waste production	8,76 kg chipboard crossers 0,15 kg PE foils 0,16 kg PET tapes 0,03 kg paper corners and labels 0,01 kg iron clips
Direct emissions	-

Use stage (excluding potential savings), B1 - B7

After completing of installation, no actions or technical operations are required during the use stages until the end of life stage. The product does not require any energy, water or material input to keep it in working order. Furthermore, it is not exposed to the indoor atmosphere of the building, nor is it in contact with the circulating water.

The product covered by this EPD does not require any maintenance as it is aimed for surface covering. In addition, due to the product durability; maintenance, repair, replacement or restoration are irrelevant in the specified applications. For this reason, no environmental loads are attributed to any of the modules between B1 and B5.

End-of-life stage, C1 - C4

The end-of-life stage is divided into the following modules:

Deconstruction – C1

The de-construction of product is supposed by the same operation as installation - with handle electric screwdriver and the same energy need.

Transport to waste processing – C2

The model use for the transportation supposed 150 km for recycling and/or energy recovery and 50 km for landfilling.

Waste processing – C3

The product is considered to be recycling (50 % of product as input for chipboard production), incinerating with energy recovery (35 %) and partly landfilling (15 %). The iron screws is supposed to be 100 recycling.

Disposal –C4

The impact of landfill (of total 15 % of waste OSB board) is taken into account according to available data.

Additional technical information of End-of-life:

Parameter	Value per declared unit
Fuel type of vehicle or vehicle type used for transport	freight, lorry 16–32 metric ton, EURO4
Distance	150 km for recycling / energy recovery 50 km for landfilling
Recycling	293 kg/DU (for chipboard production)
Energy recovery	205 kg/DU
Landfilling	88 kg/DU (of non-hazardous waste)

Reuse/recovery/recycling potential, D

Post-consumer recycling scenarios are considered within this EPD - 50 % of waste product is recycling to secondary wood and 35 % is incinerating with energy recovery.

3.3 Cut-off criteria

All operating data was taken into consideration in the analysis. Accordingly, material flows with a share of less than 1% were also balanced. It can be assumed that the total of all neglected processes does not therefore exceed 5% in the impact categories.

Accordingly, the cut-off criteria in line with EN 15804 are complied with.

3.4 Background data

All of the relevant background data sets were taken from the Ecoinvent 3 database. The data used was recorded under consistent conditions in terms of time and methods. The SimaPro 8 was used for modelling the lifecycle.

3.5 Data quality

Data on the product under review was collected directly at the production facility (Kronospan Jihlava, Czech Republic) and refers to the production processes in 2016.

3.6 Period under review

The data refers to the manufacturing processes between 01. 01. 2016 and 31. 12. 2016.

3.7 Allocation

The data used was collected in the Jihlava production facility – separated OSB production site. The product-specific data for OSB 3 Superfinish and OSB 3 SPRUCE Superfinish was collected separately for calculating the input and output flows. Energy and fuels consumption was calculated on the basis of volumes used per cubic metre of product.

3.8 Comparability

According to EN 15804, EPD of construction products may not be comparable if they do not comply with this standard. According to ISO 21930, EPD might not be comparable if they are from different programmes.

4. LCA results

The results are declared as range of values in impact categories, because of different bulk density of boards with different thickness (615 kg/m^3 for OSB 9 mm thickness to 555 kg/m^3 for OSB 30 mm thickness) and different amount of inputs between products OSB 3 and OSB 3 SPRUCE.

LCA RESULTS			PRODUCT stage	CONSTRU-CTION stage		USE stage	END OF LIFE stage				
Impact category	Unit	Total	Raw material supply Transport Manufacturing	Transport	Construction-Installation process	Use Maintenance Repair Replacement Refurbishment Operational energy use Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-recovery
		∑	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4	D

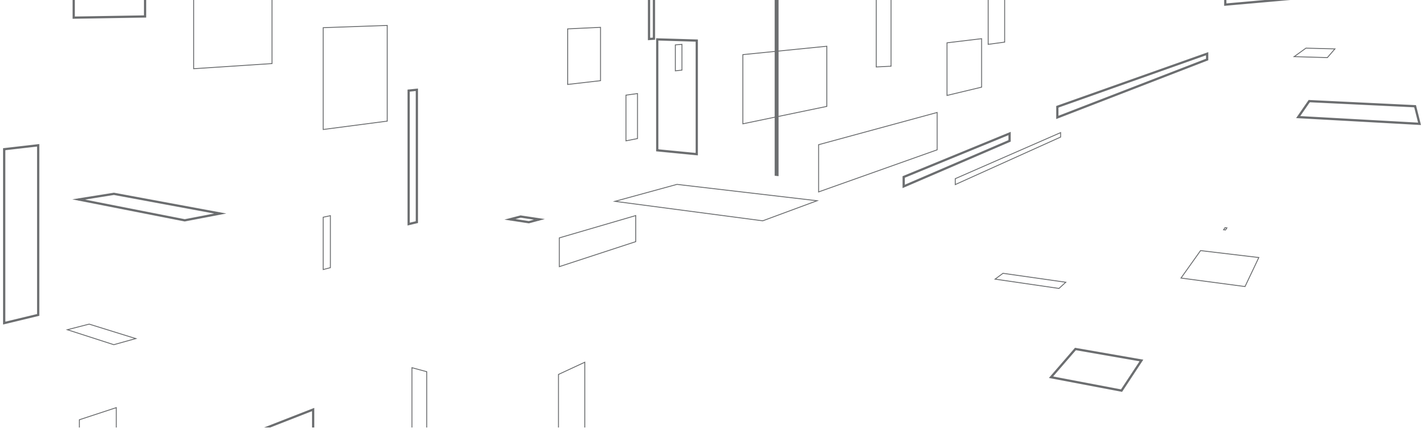
Environmental impacts

Impact category	Unit		Total	A1 – A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
Abiotic depletion	kg Sb eq	Min.	5,76E-04	1,85E-04	1,19E-04	1,43E-04	-	8,71E-08	3,43E-05	9,61E-05	1,98E-06	-3,47E-06
		Max.	5,82E-04	1,91E-04	1,19E-04	1,43E-04	-	8,71E-08	3,43E-05	9,61E-05	1,98E-06	-3,47E-06
Abiotic depletion (fossil fuels)	MJ	Min.	2,74E+03	3,71E+03	6,99E+02	1,31E+02	-	5,12E+00	2,01E+02	1,98E+03	2,47E+01	-4,01E+03
		Max.	3,57E+03	4,54E+03	6,99E+02	1,31E+02	-	5,12E+00	2,01E+02	1,98E+03	2,47E+01	-4,01E+03
Ozone layer depletion (ODP)	kg CFC-11 eq	Min.	1,52E-05	1,59E-05	3,28E-06	4,10E-07	-	2,18E-08	9,42E-07	5,10E-06	1,61E-07	-1,06E-05
		Max.	1,57E-05	1,63E-05	3,28E-06	4,10E-07	-	2,18E-08	9,42E-07	5,10E-06	1,61E-07	-1,05E-05
Photochemical oxidation	kg C_2H_4 eq	Min.	8,39E-02	1,21E-01	6,36E-03	5,87E-03	-	5,09E-05	1,83E-03	3,87E-02	1,18E-02	-1,02E-01
		Max.	9,09E-02	1,28E-01	6,36E-03	5,87E-03	-	5,09E-05	1,83E-03	3,87E-02	1,18E-02	-1,02E-01
Acidification	kg SO^2 eq	Min.	4,14E-01	1,19E+00	1,88E-01	4,84E-02	-	1,35E-03	5,41E-02	1,06E+00	1,08E-02	-2,14E+00
		Max.	5,74E-01	1,35E+00	1,88E-01	4,84E-02	-	1,35E-03	5,41E-02	1,06E+00	1,08E-02	-2,14E+00
Eutrophication	kg PO_4--- eq	Min.	2,19E-01	7,74E-01	4,46E-02	2,28E-02	-	2,10E-03	1,28E-02	4,13E-01	2,24E-01	-1,27E+00
		Max.	2,33E-01	7,88E-01	4,46E-02	2,28E-02	-	2,10E-03	1,28E-02	4,13E-01	2,24E-01	-1,27E+00
Global warming (GWP100a)	kg CO^2 eq	Min.	6,97E+01	2,44E+02	4,72E+01	8,89E+00	-	4,04E-01	1,36E+01	1,99E+02	4,41E+01	-4,87E+02
		Max.	1,08E+02	2,82E+02	4,72E+01	8,89E+00	-	4,04E-01	1,36E+01	1,99E+02	4,41E+01	-4,87E+02
Global warming (GWP100a) - with carbon sequestration*	kg CO^2 eq	Min.	-9,45E+02	-7,72E+02	4,72E+01	8,89E+00	-	4,04E-01	1,36E+01	1,99E+02	4,41E+01	-4,86E+02
		Max.	-7,6E+02	-5,87E+02	4,72E+01	8,89E+00	-	4,04E-01	1,36E+01	1,99E+02	4,41E+01	-4,86E+02

* carbon sequestration was calculated as mass of CO^2 sequestered according to the formula:

$$CO_2 \text{ seq.} = m_{dry}(timber)\times C_f \times \frac{m.m_{CO_2}}{m.m_C}$$

where C_f = percentage of carbon in dry matter, for timber = 0.5 (50%)
$m.m_{CO2}$ = molecular mass of CO^2 (44)
$m.m_c$ = atomic mass of carbon (12)
m_{dry}(timber) = dry weight of the timber in the finished product



Resource use

Parameter	Units		Total	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	Min.	-2,40E+02	2,67E+03	1,11E-01	1,86E-01	-	1,86E-01	4,42E-03	2,18E+03	0	-5,09E+03
		Max.	-5,60E+02	2,67E+03	1,11E-01	1,86E-01	-	1,86E-01	4,42E-03	2,42E+03	0	-5,65E+03
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	Min.	7,35E+03	7,76E+03	0,00E+00	-1,31E+02	-	0,00E+00	0,00E+00	2,09E+02	0	-4,87E+02
		Max.	8,02E+03	8,46E+03	0,00E+00	-1,31E+02	-	0,00E+00	0,00E+00	2,31E+02	0	-5,39E+02
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	Min.	7,08E+03	1,04E+04	1,11E-01	-1,31E+02	-	1,86E-01	4,42E-03	2,39E+03	0	-5,58E+03
		Max.	7,56E+03	1,11E+04	1,11E-01	1,86E-01	-	1,86E-01	4,42E-03	2,66E+03	0	-6,20E+03
Use of non- renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	Min.	3,05E+03	2,14E+03	6,99E+02	5,12E+00	-	5,12E+00	2,01E+02	0	0	0
		Max.	3,15E+03	2,24E+03	6,99E+02	5,12E+00	-	5,12E+00	2,01E+02	0	0	0
Use of non- renewable primary energy resources used as raw materials	MJ, net calorific value	Min.	-3,09+02	1,57E+03	0	1,26E+02	-	0	0	1,49E+03	-2,47E+01	-3,47E+03
		Max.	4,21E+02	2,30E+03	0	1,26E+02	-	0	0	1,49E+03	-2,47E+01	-3,47E+03
Total use of non- renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	Min.	3,37E+03	4,34E+03	6,99E+02	1,31E+02	-	5,12E+00	2,01E+02	1,49E+03	-2,47E+01	-3,47E+03
		Max.	3,57E+03	5,54E+03	6,99E+02	1,31E+02	-	5,12E+00	2,01E+02	1,49E+03	-2,47E+01	-3,47E+03
Use of secondary material	kg	-	0	0	0	0	-	0	0	0	0	0
Use of renewable secondary fuels	MJ, net calorific value	-	0	0	0	0	-	0	0	0	0	0
Use of non renewable secondary fuels	MJ, net calorific value	-	0	0	0	0	-	0	0	0	0	0
Use of net fresh water	m^3	Min.	8,80E-01	8,80E-01	0	0	-	0	0	0	0	0
		Max.	1,56E+00	1,56E+00	0	0	-	0	0	0	0	0

Waste categories

Parameter	Units		Total	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
Hazardous waste	kg	-	1,94E-01	1,94E-01	-	0	-	0	-	0	0	0
Non-hazardous waste disposed	kg	Min.	8,89E+01	4,20E+00	-	1,37E+00	-	0	-	0	8,33E+01	0
		Max.	9,79E+01	4,20E+00	-	1,37E+00	-	0	-	0	9,23E+01	0
Radioactive waste disposed/stored	kg	-	1,16E-02	1,15E-02	-	5,86E-05	-	5,86E-05	-	0	0	0

Waste type	Units		Total	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
Components for re-use	kg	-	0,00E+00	0	0	0	-	0	-	0	0	0
Materials for recycling	kg	Min.	3,39E+02	8,61E+01	0	4,67E+00	-	0	-	2,78E+02	0	0
		Max.	3,69E+02	8,61E+01	0	4,67E+00	-	0	-	3,08E+02	0	0
Materials for energy recovery	kg	Min.	1,97E+02	8,26E-02	0	3,08E+00	-	0	-	1,94E+02	0	0
		Max.	3,08E+02	8,26E-02	0	3,08E+00	-	0	-	2,15E+02	0	0
Exported energy	MJ per energy carrier	Min.	9,58E+03	8,33E+03	0	0	-	0	-	0	1,25E+03	0
		Max.	1,06E+04	9,23E+03	0	0	-	0	-	0	1,38E+03	0

5. LCA: Interpretation

In next diagram are represented results declared as an average of range of values in impact categories.

	Product (A1–A3)	Transport (A4)	Installation (A5)	Use (B)	End-of-life (C)	Reuse-Recovery-Recycling-potential (D)	**Total** *Environmental impacts of the product*
Abiotic depletion	0,000188	0,000119	0,000143	0,000000	0,000132	-0,000003	**5,79E-04** kg Sb/FU
Abiotic depletion (fossil fuels)	4 125,00	699,00	131,00	0,00	2 210,82	-4 010,82	**3155** MJ/FU
Global warming (GWP100a)	263,00	47,20	8,89	0,00	257,10	-487,34	**88,85** kg CO_2/FU
Global warming (GWP100a) with Carbon Sequestration	-6,79E+02	4,72E+01	8,89E+00	0,00E+00	2,57E+02	-4,86E+02	**-852,06** kg CO_2/FU
Ozone layer depletion (ODP)	0,000016	0,000003	0,000000	0,000000	0,000006	-0,000011	**1,55E-05** kg CFC-11/FU
Photochemical oxidation	0,12	0,01	0,01	0,00	0,05	-0,10	**0,08789** kg C_2H_4/FU
Acidification	1,27	0,19	0,05	0,00	1,13	-2,14	**0,4940** kg SO_2/FU
Eutrophication	0,78	0,04	0,02	0,00	0,65	-1,27	**0,2260** kg PO_4/FU

5.1 ADP - Abiotic Depletion Potential

This impact category indicator is related to extraction of minerals and fossil fuels due to inputs in the system. The Abiotic Depletion Factor (ADF) is determined for each extraction of minerals (kg antimony equivalents/kg extraction) and fossil fuels (MJ) based on concentration reserves and rate of de-accumulation. The geographic scope of this indicator is at global scale.

For non-fossil resources depletion (ADPE) the transport of products to customers and transport of raw materials play decisive roles. For abiotic depletion of fossil resources (ADPF) the transport of products and materials and consumption of electricity and resin are dominated.

5.2 GWP100a - Global Warming Potential

Climate change can result in adverse affects upon ecosystem health, human health and material welfare. Climate change is related to emissions of greenhouse gases to air. The characterization model as developed by the Intergovernmental Panel on Climate Change (IPCC) is selected for development of characterization factors. Factors are expressed as Global Warming Potential for time horizon 100 years (GWP100), in kg carbon dioxide/kg emission. The geographic scope of this indicator is at global scale.

The consumption of elecricity and resin and transport of products and materials are main processess that resulted to GWP impact.

The sequestration of carbon during tree growth has an positive impact in the raw material supply. This carbon is released again during incineration at the end of life of product.

The calculation of this category is divided to result with and without sequestration.

5.3 ODP - Ozone Creation Potential

Photo-oxidant formation is the formation of reactive substances (mainly ozone) which are injurious to human health and ecosystems and which also may damage crops. This problem is also indicated with “summer smog”. Photochemical Ozone Creation Potential (POCP) for emission of substances to air is calculated and expressed in kg ethylene equivalents/kg emission. The time span is 5 days and the geographical scale varies between local and continental scale

The main processess in this category are transport of materiaols and products and consumption of natural gas and electricity.

5.4 PO - Photochemical oxidation

Photochemical oxidants creation potential (POCP), or photochemical smog, is usually expressed relative to the POCP classification factors of ethylene.

The main processess in this category are forestry operation (harvesting), transport and resin consumption.

5.5 AP - Acidification potential

Acidifying substances cause a wide range of impacts on soil, groundwater, surface water, organisms, ecosystems and materials (buildings). Acidification Potential (AP) for emissions to air is calculated with the describing the fate and deposition of acidifying substances. AP is expressed as kg SO2 equivalents/ kg emission. The time span is eternity and the geographical scale varies between local scale and continental scale.

The main processess in this category are transport, electricity and resin consumption and forestry operation (harvesting).

5.6 EP - Eutrophication potential

Eutrophication (also known as nutrification) includes all impacts due to excessive levels of macro-nutrients in the environment caused by emissions of nutrients to air, water and soil. Nutrification potential (NP) is expressed as kg PO4 equivalents per kg emission. Fate and exposure is not included, time span is eternity, and the geographical scale varies between local and continental scale.

The main processess in this category are electricity consumption, transport, forestry operation (harvesting) and waste water production.

6. References

1. EN 15 804, Sustainability of construction works – Environmental product declaration – core rules of the product category of construction products (2012).
2. ISO 14 025: environmental labels and declarations – type III Environmental Declarations Principles and procedure (2009)
3. ISO 14 040: Environmental management – Life Cycle Assessment – Principles and framework (2006)
4. ISO 14 044: Environmental management – Life Cycle Assessment – Requirements and guidelines (2006)