

# PAGED hardwood film-faced plywood produced in Pisz and Morağ



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## **EPD program operator:**

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ITB is the verified member of The European Platform for EPD program operators and LCA practitioners.

## **Manufacturer:**

Paged Pisz Sp. z o.o.

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Telephone number: +48 87 425 48 00

Fax number: +48 87 425 49 40

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## **Basic information**

This declaration is the type III Environmental Product Declaration (EPD) based on EN 15804 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment. Their aspects were verified by the independent body according to ISO 14025. Basically, a comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804 (see point 5.3 of the standard).

**Life cycle analysis (LCA):** A1-A3 modules in accordance with EN 15804 (Cradle to Gate)

**The year of preparing the EPD:** 2021

**Declared durability:** Under normal conditions, Paged hardwood film-faced plywood has reference service life (RSL) of 50 years

**PCR:** ITB PCR A (PCR based on EN 15804)

**Declared unit:** 1 m<sup>3</sup> of ready-to-use hardwood film-faced plywood

**Reasons for performing LCA:** B2B

**Representativeness:** Polish product

## Manufacturer and Product Information

For over eighty years, Paged has been offering a wide range of products and services to its customers in Europe. Product portfolio includes natural hardwood and conifer plywood, coated and film-faced plywood, fire-retardant plywood as well as specialty plywood composites such as ELKON® or COMPREG. As a business Paged strives to deliver the industry's best solutions and products to its partners. As a result, their products create value in a range of applications, from construction sites to heavy duty road transportation, specialty packaging and furniture industries

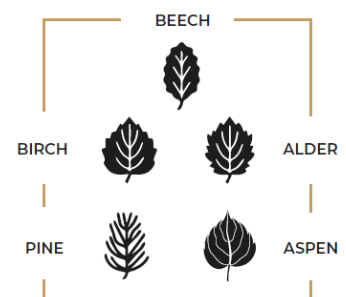


Production of all Pageds plywood is located in two sites, one in Morağ and one in Pisz. Raw wood like pine, birch, alder, aspen and beech comes from sustainably managed forests, under FSC® or PEFC™ systems for both plywood mills in north-eastern Poland. Production facilities operate in line with PN-EN ISO 9001:2015 Quality Management system, the PN-EN ISO 14001:2015 environmental management system and the occupational safety and hygiene management system PN-ISO 45001:2018.



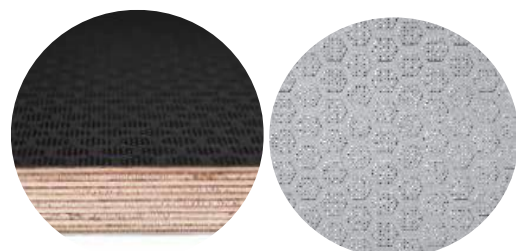
Plywood is a natural and sustainable material. With the increasing use of modern technology, Paged is constantly improving their production facilities to increase its environmental performance. All of products adhere to the new, lower formaldehyde emission norms as confirmed by ZE05 certificate and E01 as confirmed by Hygienic Certificate according to CARB and TSCA IV regulations. Products also conform with low VOC emission norms, details of which can be found in relevant technical documentation.

Plywood is made up of thin multiple cross-banded veneers. In addition to standard cross-banded construction a range of orientated special constructions, aimed at specific end uses are available. Construction of plywood can be homogenous with all veneers throughout the construction of the same wood species or combi with same species veneers on each face and alternate inner veneers of softwood and hardwood species. Natural plywood is used widely in construction (e.g. wall, floor and roof panelling), interior design and fit-out (e.g. decorative panels), furniture manufacturing, window and door manufacturing and in the production of engineered wooden flooring and stairs. All of manufactured plywood is graded as one of the four appearance classes: I, II, III and IV according to PN-EN 635-2 /635-3. Below you may find plywood types, which are grouped in this Environmental declaration as hardwood film-faced plywood.



## Paged Hexa

A durable, anti-slip birch hardwood plywood designed to sustain heavy duty usage resulting in low wear and tear over its course of life. Through specialty manufacturing process the high quality plywood board is coated with a hard wearing film overlay hot pressed into a hexagonal shape to boost its anti-slip properties and additionally highlights the decorative aspects of the surface. Paged Hexa is also available as fire-



retardant composite board for specialty applications.

## Specification of HEXA

Standard sizes	1250*2500/3000 mm 1500*2500/3000 mm
Nominal thickness	6,5-40 mm*
Density	640-760 kg/m <sup>3**</sup>
Release of formaldehyde (EN 717-1)	½ E1
Bonding quality (EN 314-2)	Class 3

\*other thicknesses available upon request  
\*\* as measured at 8-12% moisture content

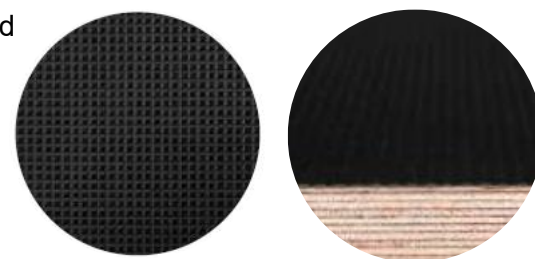
## Advantages

- ✓ anti-slip surface
- ✓ wear and tear resistance
- ✓ high load bearing capacity
- ✓ easy to clean
- ✓ resistant to light
- ✓ chemical treatment



## Paged Trans

The most durable, wear and tear resistant anti-slip plywood made with waterproof bonding resin. Paged Trans is overlaid with specialty phenolic film to assure the highest possible wear and abrasion resistance. Thanks to its construction as well as the coating this product boasts the highest anti-slip index of R11 or R13, depending on the final choice of surface coating.



## Specification of Trans

Standard sizes	1250*2500/3000 mm 1500*2500/3000 mm
Nominal thickness	12-40 mm*
Density	640-760 kg/m <sup>3**</sup>
Release of formaldehyde (EN 717-1)	½ E1
Bonding quality (EN 314-2)	Class 3

\*other thicknesses available upon request  
\*\* as measured at 8-12% moisture content

**Advantages**

- ✓ lasting effect
- ✓ highest anti-slip index R11 or R13
- ✓ impact resistant
- ✓ resistant to light
- ✓ chemical treatment
- ✓ scratch resistant



Natural product



Sustainable manufacturing process



Dimensional stability



Easy to machine

**Paged Mesh**

Paged Mesh is a birch hardwood plywood panel overlaid with durable phenolic film. It is an ideal panel for applications that require high wear resistance. The anti-slip finish is ideal for demanding applications in the transport, construction and events industries. The hard wearing coating also protects the plywood against moisture penetration. Paged Mesh, in addition to its great mechanical properties is also easy to clean and resistant to most commonly used chemicals.



**Specification of Trans**

Standard sizes	1250*2500/3000 mm 1500*2500/3000 mm
Nominal thickness	12-40 mm*
Density	640-760 kg/m <sup>3**</sup>
Release of formaldehyde (EN 717-1)	½ E1
Bonding quality (EN 314-2)	Class 3

\*other thicknesses available upon request

\*\* as measured at 8-12% moisture content

**Advantages**

- ✓ lasting effect
- ✓ highest anti-slip index R11 or R13
- ✓ impact resistant
- ✓ resistant to light
- ✓ chemical treatment
- ✓ scratch resistant



Natural product



Sustainable manufacturing process



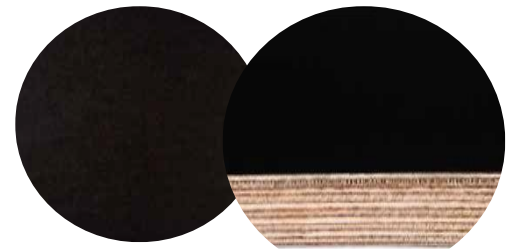
Natural product



Sustainable manufacturing process

## Paged Master Form

Flagship, waterproof bond, birch hardwood plywood overlaid with purpose-designed phenolic film. Paged Master Form was designed to perform at its best in the challenging industries of formwork and heavy-duty flooring applications.



### Specification of Master Form

Standard sizes	1250*2500/3000 mm 1500*2500/3000/3300 mm
Nominal thickness	6,5-45 mm*
Density	640-760 kg/m <sup>3**</sup>
Release of formaldehyde (EN 717-1)	½ E1
Bonding quality (EN 314-2)	Class 3

\*other thicknesses available upon request  
\*\* as measured at 8-12% moisture content

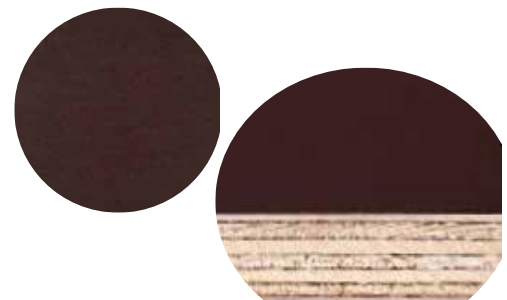
### Advantages

- ✓ easy to machine and installation
- ✓ increased moisture resistance
- ✓ impact resistant
- ✓ resistant to light
- ✓ chemical treatment



## Paged Twin Form

Paged Twin Form is a high quality birch-pine plywood overlaid with purpose designed phenolic films. It offers an upgrade in terms of resistance to water and durability when compared to imported softwood panels and allows its users to maximize the life of the product.



### Specification of Twin Form

Standard sizes	1250*2500mm 1220*2440 mm
Nominal thickness	9-40 mm*
Density	605 kg/m <sup>3**</sup>
Release of formaldehyde (EN 717-1)	½ E1
Bonding quality (EN 314-2)	Class 3

\*other thicknesses available upon request  
\*\* as measured at 8-12% moisture content

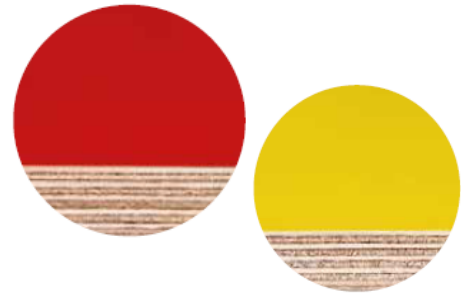
**Advantages**

- ✓ strong and rigid
- ✓ resistance to temperature fluctuations
- ✓ from -40 to +50
- ✓ high value of modulus of elasticity and bending resistance
- ✓ impact resistant
- ✓ resistant to light chemical treatment



**Paged Colour**

Paged Colour is a high quality finish birch plywood made with waterproof resin and designed for both structural and non-structural applications. It is characterised by high durability and strength, while its surface provide a decorative and easy to preserve surface.



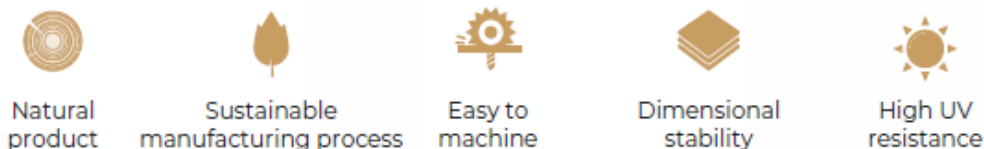
**Specification of Trans**

Standard sizes	1250*2500mm 1500*2500/3000 mm
Nominal thickness	9-30 mm*
Density	640-760 kg/m <sup>3**</sup>
Release of formaldehyde (EN 717-1)	½ E1
Bonding quality (EN 314-2)	Class 3

\*other thicknesses available upon request  
\*\* as measured at 8-12% moisture content

**Advantages**

- ✓ high durability and strength
- ✓ hygienic and easy to maintain
- ✓ high UV resistance





Environmental characteristics (LCA) for Paged hardwood film-faced plywood product is scoped for hardwood products with phenolic/melamine film, presented in table below and it is a part of production of PF hardwood with birch and beech wood for interior and exterior usage produced in Morąg.

Product	Description	% of production in Morąg	% of production in Pisz
<b>PF hardwood</b>	Phenolic formaldehyde resin hardwood plywood for outdoor usage	41,47	67,1
<b>MUPF hardwood</b>	Melamine-urea-phenolic formaldehyde resin hardwood plywood for humid conditions	0,02	9,3
<b>UF hardwood</b>	Urea formaldehyde resin hardwood plywood for indoor usage	17,42	9,3
<b>MUPF softwood</b>	Melamine-urea-phenolic resin softwood plywood for humid conditions	1,15	15,3
<b>compreg</b>	Layered wood material, hot-pressed under high pressure, made of beech or birch veneers coated with special phenolic resin	-	0,1
<b>elkon</b>	Elkon is a high density wooden laminate commonly used for the production of power transformers	-	0,8
<b>PF softwood</b>	Phenolic resin softwood plywood for outdoor usage	39,94	-

## LIFE CYCLE ASSESSMENT (LCA) – general rules applied

### Allocation

The allocation rules used for this EPD are based on general ITB-PCR A. The PAGED hardwood film-faced plywood products production is a line process with multiple co-products. Allocation was done on product mass basis.

All impacts from raw materials extraction are allocated in A1 module of EPD. 99,9% of impacts from line production were inventoried and allocated to PAGED hardwood film-faced plywood production. Municipal waste and waste water of whole factory were allocated to module A3. Electricity was inventoried for whole production process. Emissions are measured separately as well and presented in A3 module.

### System limits

The life cycle analysis of the examined products covers “Product Stage”, A1-A3 modules (Cradle to Gate) in accordance with EN 15804+A1 and ITB-PCR A. Details on systems limits are provided in product specific report. All materials and energy consumption inventoried in factory were included in calculation. Office impacts were also taken into consideration. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilized thermal energy, internal fuel and electric power consumption, direct production waste, and all available emission measurements. This study also takes into account some material flows of less than 1% and energy flows with a proportion of less than 1 %. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804, machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

### A1 and A2 Modules: Raw materials supply and transport

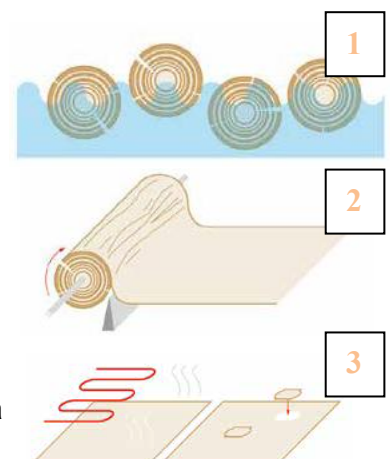
Raw materials for PAGED hardwood film-faced plywood components production come from local suppliers and more distant locations. Data on transport of the different products to the manufacturing plants is collected and modelled for factory by assessor. Means of transport include trucks and Polish and European fuel averages are applied.

The main raw material for module A1 is wood, which has a 'negative' biogenic carbon value and contributes significantly to total fossil fuel energy. The values of the environmental impact of the product in module A1 are a component of the sum of raw materials in the production of plywood.

### A3: Production

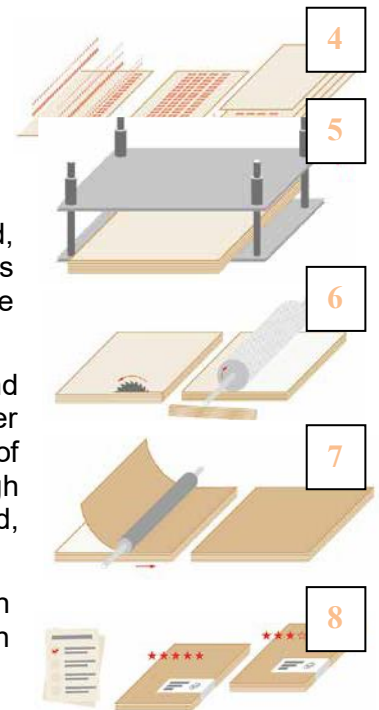
Figures to the right, show the working process during the production of PAGED hardwood film-faced plywood products in Morąg.

- 1) Wood logs which are the raw material for plywood manufacturing undergo hydrothermal processing. The hydrothermal processing is carried out in soaking pools filled with water at a temperature of 40–60°C depending on the wood species. Next, through mechanical debarking, the logs are cleared of bark and mineral residues accumulated in the bark during the process of logging and transport.
- 2) A cut to size wood log is delivered to a rotary peeling machine. Once fitted at a right angle against a rotary lathe, a log is being rotated against the blade. The peeling blade cuts a layer of veneer in the form of a veneer band.





- 3) Drying and surface repairing of veneers.
- 4) Adhesive application and plywood sets assembly.
- 5) Hot pressing. The sets of veneers are hot-pressed under pressure in hydraulic multi-platen presses. The veneers are pressed together and from now are permanently bonded.
- 6) Final processing and sanding. Following the seasoning of plywood, the plywood sheets are finally processed and cut to target size with the excess material cut off on a profiling machine. Next the surfaces of face veneers are calibrated and sanded in a precise sanding machine.
- 7) Overlaying, filming, surface treatment. If required by the end application of plywood panel, at this stage in the process a special paper impregnated with resin (also referred to as film) is applied onto the surface of plywood board. This process is carried out in high pressure and high temperature environment, causing the resin to pass to the core veneers and, as a result, to produce a surface with new performance properties.
- 8) Quality inspection and grade sorting. Sorting of plywood is based on quality inspection and classification of plywood face veneers in line with quality systems' requirements, technical standards and specifications.



## Data collection period

The data for manufacture of the examined products refer to period between 01.01.2019-31.12.2019. The life cycle assessments were prepared for Poland as reference area.

## Data quality

The values determined to calculate the LCA originate from verified Paged inventory data.

## Assumptions and estimates

The impacts of the representative Paged products for hardwood film-faced plywood were aggregated using weighted average. The weighted average method was used according to the percentage of each product in hardwood plywood based on the relation to whole production quantity. Impacts for each product and factory were inventoried and calculated separately.

## Calculation rules

LCA was done in accordance with PCR A document.

## Databases

The data for the processes come from the following databases: Ecoinvent, ITB-Data. Specific data quality analysis was a part of external ISO 14001 audit. Characterization factors are CML ver. 4.2 based on EN 15804:2012+A1:2013 version (PN-EN 15804+A1:2014-04)



LIFE CYCLE ASSESSMENT (LCA) - Results

Declared unit

The declaration refers to 1 m<sup>3</sup> of complete Paged hardwood film-faced plywood.

Table 2. System boundaries for environmental characteristic for Paged hardwood film-faced plywood

Environmental assessment information (MNA – Module not assessed, MD – Module Declared, INA – Indicator Not Assessed)																
Product stage			Construction process		Use stage							End of life				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MD	MD	MD	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA

## Paged hardwood film-faced plywood

Environmental impacts: (1 m <sup>3</sup> )					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO <sub>2</sub> eq.]	-6.88E+01	1.97E+00	4.39E+00	-6.24E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	5.24E-05	0.00E+00	0.00E+00	5.24E-05
Acidification potential of soil and water	[kg SO <sub>2</sub> eq.]	3.20E+00	1.45E-02	2.69E-01	3.48E+00
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3-</sup> eq.]	1.06E+00	1.04E-03	4.34E-03	1.06E+00
Formation potential of tropospheric ozone	[kg Ethene eq.]	2.28E+00	2.56E-03	3.90E-02	2.32E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3.35E+00	0.00E+00	1.63E-05	3.35E+00
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1.16E+04	2.11E+01	3.30E+01	1.16E+04
Environmental aspects on resource use: (1 m <sup>3</sup> )					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	9.24E+03	2.86E-02	3.55E+00	9.24E+03
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	1.21E+04	2.32E+01	3.63E+01	1.21E+04
Use of secondary material	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	3.47E+03	3.47E+03
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	[dm <sup>3</sup> ]	4.55E+02	2.00E+00	4.43E+02	9.00E+02
Other environmental information describing waste categories: (1 m <sup>3</sup> )					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	5.94E-03	0.00E+00	9.43E-01	9.49E-01
Non-hazardous waste disposed	[kg]	5.35E+01	0.00E+00	7.33E+00	6.08E+01
Radioactive waste disposed	[kg]	1.48E-02	0.00E+00	0.00E+00	1.48E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	0.00E+00	0.00E+00	9.43E-01	9.43E-01
Materials for energy recover	[kg]	0.00E+00	0.00E+00	1.66E+02	1.66E+02
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

### Verification

The process of verification of this EPD is in accordance with ISO 14025, ISO 21930. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804 and ITB PCR A
Independent verification corresponding to ISO 14025 (subclause 8.3.1)
<input checked="" type="checkbox"/> external <input type="checkbox"/> internal
External verification of EPD: PhD. Eng. Halina Prejzner
LCA, LCI audit and input data verification: M.Sc. Eng. Dominik Bekierski, <a href="mailto:d.bekierski@itb.pl">d.bekierski@itb.pl</a>
Verification of LCA: PhD Eng. Michał Piasecki, <a href="mailto:m.piasecki@itb.pl">m.piasecki@itb.pl</a>

### References

- ITB PCR A- General Product Category Rules for Construction Products
- ISO 14025:2006 Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services
- ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2011 Buildings and constructed assets -- Service life planning -- Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets -- Service-life planning -- Part 8: Reference service life and service-life estimation
- EN 15804:2012+A1:2013 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- EN 15942:2011 Sustainability of construction works - Environmental product declarations - Communication format business-to-business



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# **CERTIFICATE № 205/2021 of TYPE III ENVIRONMENTAL DECLARATION**

Product:

**PAGED hardwood film-faced plywood produced in Pisz and Morąg**

Manufacturer:

**Paged Pisz Sp. z o.o.**

Kwiatowa 1, 12-200 Pisz, Poland

confirms the correctness of the data included in the development of  
Type III Environmental Declaration and accordance with the requirements of the standard

**PN EN 15804+A1:2014-04**

**Sustainability of construction works.**

**Environmental product declarations.**

**Core rules for the product category of construction products.**

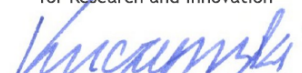
This certificate, issued for the first time on 22<sup>nd</sup> March 2021 is valid for 5 years  
or until amendment of mentioned Environmental Declaration

Acting Head of the Thermal Physic, Acoustics  
and Environment Department

  
Agnieszka Winkler-Skalna, PhD



Deputy Director  
for Research and Innovation

  
Krzysztof Kuczyński, PhD

Warsaw, March 2021