Environmental Product Declaration Type III ITB No. 126

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ADOPEN PLASTİK ve İNŞAAT SANAYİ A.Ş
PENWOOD system profiles

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ITB is the verified member of The European Platform for EPD program operators and LCA practitioner www.eco-platform.org

Basic information

This declaration is the type III Environmental Product Declaration (EPD) based on EN 15804:2012+A2:2019 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 15804:2012+A2:2019 (see point 5.3 of the standard).

Life cycle analysis (LCA): A1-A3, C1-C4 and D modules in accordance with EN 15804:2012+A1 (Cradle to Gate with options)

The year of preparing the EPD: 2020

Product standards: EN 12608-1

Service Life: 25 years

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

Declared unit: 1 running metre of PVC-u profile system

Reasons for performing LCA: B2B

Representativeness: Turkish production, year 2019 (production)

MANUFACTURER AND PRODUCTS DESCRIPTION

Adopen, the global PVC profile manufacturer, was established in Antalya in 1997, with knowledge and experience of Çağlar Plastics Ind., which is one of the pioneering window producers of Turkey. Adopen new facilities were located at the Antalya Industrial Zone in 2003, which is one of the largest industrial zones of Middle East. Manufacturing process is carried out in shifts 7 days a week, 24 hours a day at the Adopen production facilities which cover an area of 550k m².

PVC Profiles along with the auxiliary profiles are mainly made of Polyvinyl Chloride (PVC). PVC profiles also contain other raw materials such as acrylic impact modifiers, wood powder, stabilizers and calcium carbonate. Base materials (input to a product system) are as follows: PVC resin (63%), filler/calcium carbonate (13%), pine tree wood powder (15%), additives/modificators (9%), foil and packings. Figure 1 provides a scheme of manufacturing process of the PENWOOD system profiles.

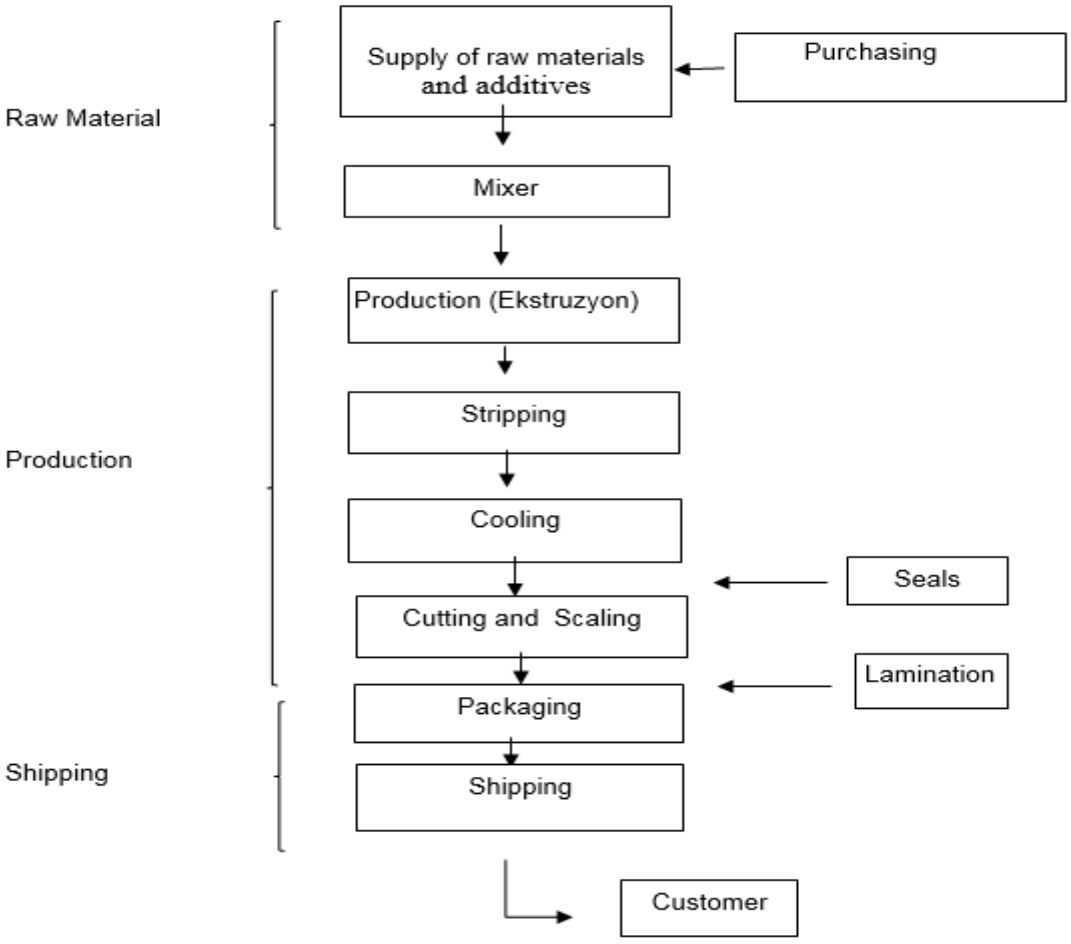

Figure 1. A scheme of manufacturing process of the PENWOOD system profiles

In production process a special compound is prepared by adding the PVC raw material, produced with polymerization of vinyl chloride monomer, components providing impact resistance, color pigments, stabilizer and other filling materials. The preparation of this compound by adding high quality additives is the first step to the production of Adopen profiles. This compound is processed by the extruders and Adopen tooling components and double sided protective folios and, then converted into Adopen profile. In the Penwood system, welding is done by using welding moulds present in the single-double head welding machines. Only weld time and melt down period has to be adjusted. Weld time varies from machine to machine, melting temperature is 240 and melting time is 28 secs and standby time is 30 secs. Average corner weld strength value according to EN 514 is 5 kN. All detailed technical documentation of the PENWOOD system can be found at http://www.adopen.com.

Unit weight	1.9 kg/m
Thermal Conductivity	U_f 0,90 W/m^{2}K, U_w : 0,77 W/m^{2}K
Color	White,caramel
Lamination	Film coating
Thickness Class	A
Impact class	Class 1
Applications	Window and balcony doors made from PVC-u profiles.

Turkish Standards Institution Reference Number of License is 026675-TSE-02/02.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

The LCA for this EPD is conducted according to the guidelines of ISO 14040-44, the requirements given in the Product Category Rules (ITB PCR-A), PN EN 15804:2012 + A1:2013 Sustainability of Construction Works: Environmental Product Declarations and the general program guidelines by ITB EPD system. As on the day of issuing the declaration, the transition period for the implementation and implementation of the EN 15804 + A2 standard applies, therefore ITB partially does it best to implement the new provisions of Annex 2 . The LCI inventory (verified) for the LCA study is based on the year 2019. Production figures for PENWOOD profiles and detailed profiles' from production plant were collected by manufacturer. This LCA was modelled with ITB internal software using the latest version of the Ecoinvent database and impact models. The EPD, its background data and the results may be used for business-to-business communications and is expected to be a reliable document for green building designers, architectures, manufacturers of construction products and the other stakeholders in the construction sector to understand the potential environmental impacts caused by PVC Profiles.

Unit

The functional unit is 1 running meter of PENWOOD system. However, this EPD declaration also provides conversion to 1 kg unit.

System boundary

The life cycle analysis of the declared products covers "Product Stage" A1-A3, and End of Life stage C1, C2, C3, C4 and gains beyond system in D module (Cradle to Gate with options) accordance with EN 15804:2012+A1:2013 and ITB PCR A. The system boundary covers the production of raw materials, all relevant transport down to factory gate and manufacturing by ADOPEN Plastic (cradle to gate). The review framework comprises the following details:

- Raw materials acquisition and transport,
- Further processing of raw materials for main bodies of PVC Profiles,
- Production operations includes extruder, cooling ponds, dragger, cutting for delivery,
- Energy and water consumption, waste management; and
- Packaging of the product final for delivery.

Allocation

Production of the Progress Products is a line process in one manufacturing plant located at Antalya Industrial Zone, Turkey. Allocation of impact is done on product mass basis (100 % of whole production). The impacts from raw materials extraction/production (PVC, calcite, pine tree powder, additives, gasket, packing, foil) are allocated in A1 module of the LCA (not including 0,5% of secondary production inputs). 99% of impacts from a line production were allocated to product covered by this declaration. Module A2 includes transport of raw materials such as PVC from their suppliers to manufacturing plant. Municipal wastes of factory were allocated to module A3. Energy supply (electricity) was inventoried for whole factory and allocated to the product assessed A3 but electricity production to A1. Emissions in the factory are assessed using national Turkish emission factors for energy carriers (ON) and electricity and were allocated to module A3.

System limits

99.5% materials and 99.5% energy consumption was inventoried in factory and were included in calculation. In the assessment, all significant parameters from gathered production data are considered, It is assumed that the total sum of omitted processes does not exceed 1% of all impact categories. In accordance with EN 15804:2012+A1:2013, 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 (PVC, calcite, pine tree powder, additives, gasket, packing, foil) come mainly from national suppliers partly providing environmental data for production (ISO 14001). Data on transport of the different input products to the manufacturing plants were inventoried in detail and modelled by assessor. Means of transport include trucks. For calculation purposes European fuel averages are applied. Transport is only relevant for delivery of raw materials to the plant.

A3: Production

The production process is presented in Fig. 1. Production stages start with extrusion of PVC and continue with cooling, dragging and cutting for PVC Profiles and the process goes on as coating, cleaning, sleeking, drying and adhesion for PVC Profiles. Only electric energy is consumed during the manufacturing of PVC Profiles, no natural gas is consumed for the production.

End of life scenarios (C module)

It is assumed in phase C1 that products are removed/re-assembled by a small-scale electromechanical equipment (electricity used). It is assumed that at the end of life the transport distance from the product deconstruction place to waste processing (C2) is 50 km on > 16 t loaded lorry with 75% capacity utilization and fuel consumption of 30 l of ON per 100 km. Materials recovered from dismantled products are recycled and landfilled according to the Turkish and European treatment practice (mass allocation of national vs exported profiles) of industrial waste what is presented in Table 1. According to the recycling rates of Turkey 11% of PVC products are collected for sending

to the recycling process and the rest of is sent to the landfill for their final disposal and this is modelled as such in the LCA. The reuse, recovery and recycling potential for a new product system is considered beyond the system boundaries (module D) based on literature recommendations (Turkish Life Cycle Inventory Dataset) and potentially realistic practice based on authors experience (where PVC after reprocessing can be the resource to production of new PVC).

Table 1. End of life scenarios for PENWOOD PVC system

Progress products	Material recovery	Recycling	Landfilling	Incineration
Steel screens	100%	31%	55%	14%

Data collection period

The data for manufacture of the declared products refer to period between 01.01.2019 – 31.12.2019 (1 year). The life cycle assessments were prepared for Turkey as reference area.

Data quality - production

The values determined to calculate A3 originate from verified Progress LCI inventory data filled by ADPOEN representative. A1 values were prepared considering Ecoinvent data. PVC data is supported by Plastics Europe report and European Commission Report on PVC.

Calculation rules

LCA was done in accordance with ITB PCR A document.

Databases

The background data for the processes come from the following databases: Ecoinvent v.3.5, Plastic Europe. Specific data quality analysis was a part of external audit. Characterization factors are CML ver. 4.2 based. ITB-LCA algorithms were used for all impact calculations. The time related quality of the data used is valid (5 years).

Heavy Metals content

Selected samples of PVC profiles have been tested (January 2021) in the accredited ITB laboratory for the presence of heavy metals; As, Cd, Cr, Pb, Cu, Ni, Zn, Hg (Test Report No 03456/20/Z00NZF). Determination of heavy metals content in PVC profiles included chemical analysis of a fragmented and averaged sample, prepared from a cross-section (for mass-colored profiles). The metal content was determined by the atomic absorption spectrometry (ETAAS or FAAS techniques).

Table 2. Heavy metals content content in PVC profiles

Metal	CONTENT* [%]		
	OAK GOLD PVC Profile	Polymer wood composite core	WHITE PVC Profile
As	<0,003	<0,003	<0,003
Cd	<0,0001	<0,0001	<0,0001
Pb	<0,002	<0,002	<0,002
Cr	0,057 ± 0,011	<0,002	<0,002
Ni	<0,002	<0,002	<0,002
Cu	<0,002	<0,002	<0,002
Zn	0,016 ± 0,003	0,072 ± 0,014	0,064 ± 0,013
Hg**	<0,00005	<0,00005	<0,00005

*** The mercury (Hg) content in mineralizates was determined by the AAS method using the AMA mercury analyzer*

On the basis of the results obtained for the selected samples, it is concluded that heavy metals such as Cadmium, Lead or Mercury (Amalgam) are not used in the production process.

Recycyling issues

Based on the conducted tests, the recyclates used in the production of window profiles do not impact product with heavy metals such as Cadmium, Lead, Arsen or Mercury. The producer introduces the non-waste stategy in the production process and PVC production waste is reused in a production line as secondary input. In accordance to documentation provided by manufacturer (co-ex) recycling product input rate is 5% for Penwood profiles. Producer uses virgin (fresh) PVC in all profile covers.

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to the unit FU– 1 kg of the PENWOOD profile.

Table 3. System boundaries (modules included) in a product environmental assessment

Environmental assessment information (MA – Module assessed, MNA – Module not assessed, 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
MA	MA	MA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MA	MA	MA	MA	MA

Table 4. Environmental product characteristic – 1 kg of PENWOOD profile

Environmental impacts: (FU) 1 kg									
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
Global warming potential	kg CO_2 eq.	2,19E+00	4,46E-02	2,94E-01	3,54E-01	3,97E-03	4,44E-01	2,97E-02	-1,12E-01
Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	1,08E-06	0,00E+00	1,20E-09	3,90E-09	0,00E+00	8,77E-08	1,26E-09	-9,53E-10
Acidification potential of soil and water	kg SO_2 eq.	5,35E-03	3,28E-04	7,29E-04	3,11E-04	2,90E-05	5,27E-04	3,85E-05	-9,53E-05
Formation potential of tropospheric ozone	kg Ethene eq.	5,38E-04	2,32E-05	3,74E-02	1,61E-03	2,11E-06	5,75E-04	7,15E-06	-5,53E-04
Eutrophication potential	kg $(PO_4)^{3-}$ eq.	8,45E-04	5,79E-05	1,41E-04	1,30E-05	5,11E-06	3,68E-04	1,89E-05	1,38E-06
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq.	1,89E-02	0,00E+00	1,09E-06	2,63E-03	0,00E+00	1,53E-03	6,60E-04	-7,00E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ	3,48E+01	2,46E-01	3,61E-02	4,05E+00	3,38E-01	2,45E+00	1,43E-01	-1,35E+00
Environmental aspects: (FU) 1 kg									
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	4,55E+00	1,72E-02	2,78E-03	6,08E-01	3,28E-02	3,35E-01	1,49E-01	-1,63E-01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	4,90E+01	2,58E-01	3,76E-02	4,46E+00	3,55E-01	2,76E+00	1,49E-01	-1,49E+00
Use of secondary material	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels	MJ	1,27E-05	1,29E-02	0,00E+00	0,00E+00	1,78E-02	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net use of fresh water	m^3	3,25E-03	1,00E-06	8,13E-05	1,28E-03	3,22E-03	1,28E-03	1,10E-04	-4,07E-04
Other environmental information describing waste categories: (FU) 1 kg									
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1,33E-04	4,60E-06	1,58E-03	5,40E-06	2,53E-08	3,76E-06	2,09E-07	-1,80E-06
Non-hazardous waste disposed	kg	1,80E-01	4,27E-03	3,72E-03	4,88E-02	2,35E-05	3,50E-02	5,51E-01	1,54E-01
Radioactive waste disposed	kg	4,66E-05	0,00E+00	0,00E+00	5,40E-06	0,00E+00	5,92E-06	7,92E-07	-1,61E-06
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	4,90E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recover	kg	0,00E+00	0,00E+00	0,00E+00	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	0,00E+00	0,00E+00	0,00E+00

Table 4. Environmental product characteristic – 1 running meter of PENWOOD profile

Environmental impacts: (FU) 1 running meter									
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
Global warming potential	kg CO_2 eq.	4,16E+00	8,47E-02	5,59E-01	6,73E-01	7,54E-03	8,44E-01	5,64E-02	-2,13E-01
Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	2,05E-06	0,00E+00	2,28E-09	7,41E-09	0,00E+00	1,67E-07	2,39E-09	-1,81E-09
Acidification potential of soil and water	kg SO_2 eq.	1,02E-02	6,23E-04	1,39E-03	5,91E-04	5,51E-05	1,00E-03	7,32E-05	-1,81E-04
Formation potential of tropospheric ozone	kg Ethene eq.	1,02E-03	4,41E-05	7,11E-02	3,06E-03	4,01E-06	1,09E-03	1,36E-05	-1,05E-03
Eutrophication potential	kg $(PO_4)^{3-}$ eq.	1,61E-03	1,10E-04	2,68E-04	2,47E-05	9,71E-06	6,99E-04	3,59E-05	2,62E-06
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq.	3,59E-02	0,00E+00	2,07E-06	5,00E-03	0,00E+00	2,91E-03	1,25E-03	-1,33E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ	6,61E+01	4,67E-01	6,86E-02	7,70E+00	6,42E-01	4,66E+00	2,72E-01	-2,57E+00
Environmental aspects: (FU) 1 running meter									
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	8,65E+00	3,27E-02	5,28E-03	1,16E+00	6,23E-02	6,37E-01	2,83E-01	-3,10E-01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	9,31E+01	4,90E-01	7,14E-02	8,47E+00	6,75E-01	5,24E+00	2,83E-01	-2,83E+00
Use of secondary material	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels	MJ	2,41E-05	2,45E-02	0,00E+00	0,00E+00	3,38E-02	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	#ARG!	0,00E+00	0,00E+00	0,00E+00
Net use of fresh water	m^3	6,18E-03	1,90E-06	1,54E-04	2,43E-03	6,12E-03	2,43E-03	2,09E-04	-7,73E-04
Other environmental information describing waste categories: (FU) 1 running meter									
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	2,53E-04	8,74E-06	3,00E-03	1,03E-05	4,81E-08	7,14E-06	3,97E-07	-3,42E-06
Non-hazardous waste disposed	kg	3,42E-01	8,11E-03	7,07E-03	9,27E-02	4,47E-05	6,65E-02	1,05E+00	2,93E-01
Radioactive waste disposed	kg	8,85E-05	0,00E+00	0,00E+00	1,03E-05	0,00E+00	1,12E-05	1,50E-06	-3,06E-06
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	9,31E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recover	kg	0,00E+00	0,00E+00	0,00E+00	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	0,00E+00	0,00E+00	0,00E+00

RESULTS INTERPRETATION

Interpretation of the results has been carried out considering the methodology, data-related assumptions and any limitations declared in the EPD. The amount of primary energy required for the production of a PVC window frame (49 MJ/kg) is considerably larger than that for average wooden window frame production. The environmental impact of PENWOOD profile (cradle to gate with options) is largely dependent on the energy-intensive and chemical production of PVC resin on which the manufacturer has only a little influence. The impact of the production line depends on the amount of electricity consumed by manufacturing plant but in overall results is not significant. There are no large scale emissions or environmental impacts detected in the A3 production processes alone impacts the overall A1-A3 results. Summary of overall life cycle impacts when taking into account the Global Warming Potential of A1-A3 it becomes clear that the carbon impact 2.5 kg CO_2/kg of profile is relatively good value comparing to aluminum and wood frames. In this category 70% of GWP impact comes from PVC production. The production of high-quality PVC as input material (module A1) therefore has the greatest impact on the environmental PENWWOD profile characteristic.
Also the low value of the Acidification potential for PVC is worth noting. Additionally, the hydrocarbons emitted from the material during PVC production is treated with exhaust air cleaning systems for workplace security and environmental reasons, and hence, do not reach the environment. The stabilizers based on Ca/Zn compounds are nontoxic. The production processes of the PVC material continue to dominate the ecological impact in all categories.
Recycling is a crucial issue for the life cycle of PVC window frames. A controlled closed-loop recycling scenario results in considerably lower environmental impacts. However, closed-loop recycling can only work in growing PVC markets (export to Europe), i.e. PVC recycling potential in Turkey is only 13%. In addition, problems may arise in closed loop recycling because of the fast enhancement of stabilizer systems that may lead to non-compatible stabilizer systems appearing in the same recycling material. This problem, however, is not prevalent at the moment, as the most common stabilizers are compatible and can therefore be mixed together. Co-extrusion with a cover layer of virgin material could solve this problem for non-compatible stabilizers. The PENWWOD products, due to the average actual potential for reuse and the potential for significant reuse for PVC production, have no significant environmental gains in module D.

VERIFICATION

The process of verification of this EPD was in accordance with ISO 14025 and 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 15804:2012+A2:2019 and ITB PCR A
Independent verification corresponding to ISO 14025 (sub clause 8.1.3.) ☒ external ☐ internal
External verification of EPD: Ph.D. Eng. Halina Prejzner LCA, LCI audit and input data verification: Ph.D. Eng. Michał Piasecki, m.piasecki@itb.pl Verification of LCA: Ph.D. Eng. Justyna Tomaszewska, j.tomaszewska@itb.pl

Normative references

- https://pvc4pipes.com/wp-content/uploads/2018/02/PlasticsEurope_Eco-profile_VCM_PVC_2015-05.pdf
- https://ec.europa.eu/environment/waste/studies/pdf/pvc-final_report_lca.pdf
- 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+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- /Ecoinvent / Ecoinvent Centre, www.Eco-invent.org
- /TLCID/ Turkish Life Cycle Inventory Database, Turkish Center for Sustainable Production Research and Design (SÜRATAM), www.surdurulebiliruretimmerkezi.org

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CERTIFICATE № 126/2020
of TYPE III ENVIRONMENTAL DECLARATION

Product:

PENWOOD system profiles

Manufacturer:

ADOPEN PLASTİK ve İNŞAAT SANAYİ A.Ş

Sanayi Bölgesi 2.Kısım Mah.21 Cad.No:3 Döşemealtı/Antalya,Turkey

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+A2

Sustainability of construction works.
Environmental product declarations.
Core rules for the product category of construction products.

This certificate, issued for the first time on 30th June 2020 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Deputy Head of the Thermal Physic, Acoustics and Environment Department
Agnieszka Winkler-Skalna, PhD

INSTYTUT TECHNIKI BUDOWLANEJ

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Warsaw, June 2020