Environmental
Product
Declaration
According to ISO14025 and EN15804+A2
(+indicators A1)

This declaration is for:
Adfil Strux & Durus FF32

Provided by:
Adfil N.V.

program operator
Stichting MRPI®
publisher
Stichting MRPI®
www.mrpi.nl

MRPI® registration
1.1.00734.2024
date of first issue
28-1-2025
date of this issue
28-1-2025
expiry date
28-1-2030

COMPANY INFORMATION

Adfil N.V.
Industriestraat 39, zone 2
9240 ZELE, BELGIUM
Saeid Ghorbani
https://adfil.com

MRPI® REGISTRATION

1.1.00734.2024

DATE OF ISSUE

28-1-2025

EXPIRY DATE

28-1-2030

SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by Roel van Oosterhout, EcoReview B.V. The LCA study has been done by Anne Kees Jeeninga, Advieslab VOF. The certificate is based on an LCA-dossier according to EN15804+A2 (+indicators A1). It is verified according to the 'MRPI®-EPD verification protocol November 2020.v4.0'. EPD's of construction products may not be comparable if they do not comply with EN15804+A2. Declaration of SVHC that are listed on the 'Candidate list of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

PROGRAM OPERATOR

Stichting MRPI®
Kingsfordweg 151
1043 GR
Amsterdam

Ing. L. L. Oosterveen MSc. MBA
Managing Director MRPI

PRODUCT

Adfil Strux & Durus FF32

DECLARED UNIT/FUNCTIONAL UNIT

1 kg

DESCRIPTION OF PRODUCT

Adfil Strux and Durus FF32 are synthetic fiber reinforcements designed for concrete applications. Both products are manufactured using high-quality polymers, primarily polypropylene (PP) and high-density polyethylene (HDPE), sourced from various plastic suppliers and recyclers.

VISUAL PRODUCT

MORE INFORMATION

https://adfil.com/synthetic-macro-fibres

DEMONSTRATION OF VERIFICATION
CEN standard EN15804 serves as the core PCR(a)
Independent verification of the declaration an data according to ISO14025 and EN15804+A2 (+indicators A1) internal: external: x
Third party verifier: Anne Kees Jeeninga, Advieslab VOF
[a] PCR = Product Category Rules

DETAILED PRODUCT DESCRIPTION

Adfil Strux and Durus FF32 are high-performance synthetic fibers designed for concrete reinforcement applications. Manufactured primarily from polypropylene (PP) and high-density polyethylene (HDPE), these fibers provide enhanced durability, crack resistance, and improved mechanical properties for concrete.

Both variants are produced through an extrusion process, followed by drawing, cutting, and packaging. The two products differ in fiber lengths and packaging quantities, tailored to meet specific construction requirements.

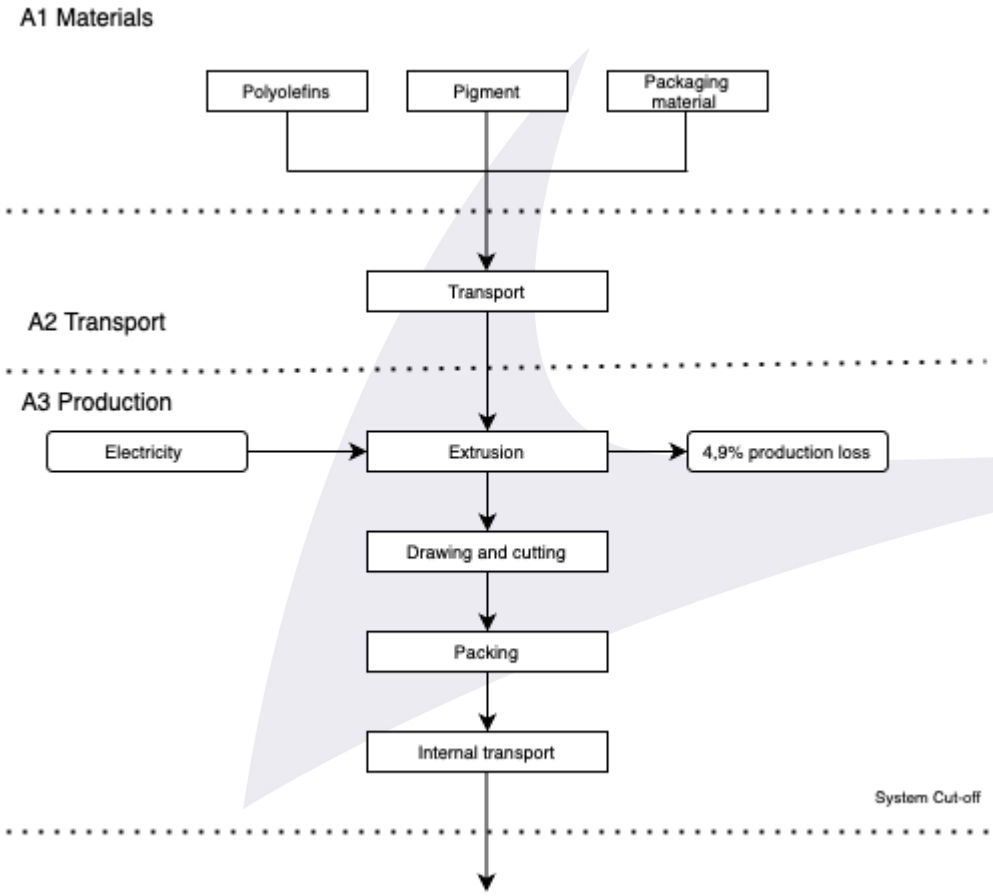
Strux & Durus FF32 ynthetic fibres are designed with dimensions of 40mm x 1,35mm x 0,1mm, featuring a density of 0,914 (macro) / 0,905 (micro) kg/m³. These fibres are EN 14889-2 certified, ensuring compliance with industry standards for quality and performance.

Component (> 1%)	(kg / %)
Polyolefins	0,99699999
	0,00300001

SCOPE AND TYPE

The type of this EPD is Cradle-to-Gate. All major steps from the extraction of natural resources to the factory gate are included in the environmental performance of the manufacturing phase, except those that are not relevant to the environmental performance of the product.
The software SimaPro is used to perform the LCA. The background databases used are:
• Ecoinvent (v3.6) . It is not determined as to how the synthetic fibers are to be processed at the end of life (after 50 years). Therefore, this module is not considered in this LCA study. As new and improved systems for the recycling of building products are developed over time, these can be determined and then applied to a future LCA study.

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USER STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport gate to site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction 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
X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
X= Modules Assessed ND= Not Declared																



REPRESENTATIVENESS

This EPD is representative for products produced and sold in the EU. The synthetic fibers are produced and cut to demand at the production site of Adfil N.V.

ENVIRONMENTAL IMPACT per functional unit or declared unit (core indicators A1)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADPE	kg Sb eq.	2,04 E-05	1,51 E-06	5,18 E-06	2,71 E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADPF	MJ	7,57 E+01	9,04 E-01	3,53 E+00	8,02 E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP	kg CO2 eq.	2,12 E+00	5,92 E-02	3,99 E-01	2,57 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ODP	Kg CFC11 eq.	5,02 E-08	1,05 E-08	1,00 E-07	1,61 E-07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
POCP	Kg ethene eq.	1,78 E-03	3,57 E-05	7,43 E-05	1,89 E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AP	kg SO2 eq.	6,85 E-03	2,60 E-04	5,60 E-04	7,67 E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP	kg (PO4) 3- eq.	7,16 E-04	5,11 E-05	1,12 E-04	8,79 E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toxicity indicators for Dutch market																			
HTP	kg DCB-Eq	3,37 E-01	2,49 E-02	1,11 E-01	4,73 E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FAETP	kg DCB-Eq	2,03 E-02	7,27 E-04	3,17 E-03	2,42 E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAETP	kg DCB-Eq	2,20 E+01	2,62 E+00	6,69 E+00	3,13 E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TETP	kg DCB-Eq	3,96 E-03	8,80 E-05	3,10 E-04	4,36 E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ECI	euro	1,80 E-01	1,00 E-02	3,00 E-02	2,24 E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADPF	kg Sb eq.	3,64 E-02	4,35 E-04	1,70 E-03	3,86 E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ADPE = Abiotic Depletion Potential for non-fossil resources
ADPF = Abiotic Depletion Potential for fossil resources
GWP = Global Warming Potential
ODP = Depletion potential of the stratospheric ozone layer
POCP = Formation potential of tropospheric ozone photochemical oxidants
AP = Acidification Potential of land and water
EP = Eutrophication Potential
HTP = Human Toxicity Potential
FAETP = Fresh water aquatic ecotoxicity potential
MAETP = Marine aquatic ecotoxicity potential
TETP = Terrestrial ecotoxicity potential
ECI = Environmental Cost Indicator
ADPF = Abiotic Depletion Potential for fossil resources expressed in [kg Sb-eq.]

ENVIRONMENTAL IMPACT per functional unit or declared unit (core indicators A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	2,21 E+00	5,97 E-02	4,02 E-01	2,67 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-fossil	kg CO2 eq.	2,20 E+00	5,97 E-02	4,01 E-01	2,66 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-biogenic	kg CO2 eq.	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-luluc)	kg CO2 eq.	2,32 E-03	2,19 E-05	8,55 E-04	3,19 E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ODP	kg CFC11 eq.	4,78 E-08	1,32 E-08	6,68 E-08	1,28 E-07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AP	mol H+ eq.	8,25 E-03	3,46 E-04	7,39 E-04	9,34 E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-freshwater	kg PO4 eq.	4,88 E-05	6,02 E-07	8,16 E-06	5,75 E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-marine	kg N eq.	1,45 E-03	1,22 E-04	1,82 E-04	1,76 E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-terrestrial	mol N eq.	1,57 E-02	1,34 E-03	2,31 E-03	1,93 E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
POCP	kg NMVOC eq.	6,92 E-03	3,84 E-04	5,72 E-04	7,87 E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP-minerals & metals	kg Sb eq.	2,03 E-05	1,51 E-06	5,18 E-06	2,70 E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP-fossil	MJ, net calorific value	7,64 E+01	9,00 E-01	1,30 E+01	9,03 E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
WDP	m3 world eq. Deprived	1,62 E+00	3,22 E-03	4,49 E-01	2,07 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

GWP-total = Global Warming Potential total
GWP-fossil = Global Warming Potential fossil fuels
GWP-biogenic = Global Warming Potential biogenic
GWP-luluc = Global Warming Potential land use and land use change
ODP = Depletion potential of the stratospheric ozone layer
AP = Acidification Potential, Accumulated Exceedence
EP-freshwater = Eutrophication Potential, fraction of nutrients reaching freshwater end compartment
EP-marine = Eutrophication Potential, fraction of nutrients reaching marine end compartment
EP-terrestrial = Eutrophication Potential, Accumulated Exceedence
POCP = Formation potential of tropospheric ozone photochemical oxidants
ADP-minerals&metals = Abiotic Depletion Potential for non-fossil resources [2]
ADP-fossil = Abiotic Depletion for fossil resources potential [2]
WDP = Water (user) deprivation potential, deprivation-weighted water consumption [2]

Disclaimer [2]
- The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ENVIRONMENTAL IMPACT per functional unit or declared unit (additional indicators A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Disease incidence	6,98 E-08	5,36 E-09	5,20 E-09	8,03 E-08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
IRP	kBq U235 eq.	4,60 E-02	3,77 E-03	1,58 E-01	2,08 E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETP-fw	CTUe	1,34 E+01	8,02 E-01	4,65 E+00	1,89 E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HTP-c	CTUh	5,15 E-10	2,60 E-11	1,69 E-10	7,10 E-10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HTP-nc	CTUh	1,44 E-08	8,78 E-10	2,40 E-09	1,77 E-08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SQP	----	7,08 E+00	7,80 E-01	8,28 E+00	1,61 E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

PM = Potential incidence of disease due to PM emissions
IRP = Potential Human exposure efficiency relative to U235 [1]
ETP-fw = Potential Comparative Toxic Unit for ecosystems [2]
HTP-c = Potential Comparative Toxic Unit for humans [2]
HTP-nc = Potential Comparative Toxic Unit for humans, non-cancer [2]
SQP = Potential soil quality index [2]

Disclaimer [1]
- 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.

Disclaimer [2]
- The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 / A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	9,78 E-06	2,28 E-06	5,12 E-06	1,72 E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NHWD	kg	7,69 E-02	5,71 E-02	3,82 E-02	1,72 E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RWD	kg	4,06 E-05	5,91 E-06	1,35 E-04	1,81 E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CRU	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MFR	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MER	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EEE	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETE	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

HWD = Hazardous Waste Disposed
NHWD = Non Hazardous Waste Disposed
RWD = Radioactive Waste Disposed
CRU = Components for reuse
MFR = Materials for recycling
MER = Materials for energy recovery
EEE = Exported Electrical Energy
ETE = Exported Thermal Energy

RESOURCE USE per functional unit or declared unit (A1 / A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PERM	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PERT	MJ	2,28 E+00	1,13 E-02	1,89 E+00	4,18 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRE	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRM	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRT	MJ	8,20 E+01	9,55 E-01	1,32 E+01	9,62 E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SM	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RSF	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NRSF	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FW	m3	2,65 E-02	1,10 E-04	1,16 E-02	3,82 E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

PERE = Use of renewable energy excluding renewable primary energy resources
PERM = Use of renewable energy resources used as raw materials
PERT = Total use of renewable primary energy resources
PENRE = Use of non-renewable primary energy resources excluding non-renewable energy resources used as raw materials
PENRM = Use of non-renewable primary energy resources used as raw materials
PENRT = Total use of non-renewable primary energy resources
SM = Use of secondary materials
RSF = Use of renewable secondary fuels
NRSF = Use of non-renewable secondary fuels
FW = Use of net fresh water

BIOGENIC CARBON CONTENT per functional unit or declared unit (A1 / A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
BBCpr	Kg C	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BCCpa	kg C	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

BCCpr = Biogenic carbon content in product
BCCpa = Biogenic carbon content in packaging

CALCULATION RULES

Data quality

Data flows have been modeled as realistically as possible. Data quality assessment is based on the principle that the primary data used for processes occurring at the production site is selected in the first instance. Where this is not available, other reference data is selected from appropriate sources.

Data collection period

The dataset is representative for the production processes used in 2023.

Methodology and reproducibility

The process descriptions and quantities in this study are reproducible in accordance to the reference standards that have been used. The references of all sources, both primary and public sources and literature, have been documented. In addition, to facilitate the reproducibility of this LCA, a full set of data records has been generated."

Cut Off

In this study, all inputs and outputs - such as emissions, energy and material inputs - are included in the calculation according to the Determination Method (5). The contribution to each impact category by the capital goods is calculated to be no more than 5%.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

A1. Raw materials supply

All materials needed for production as well as packaging is taken into account.

A2. Transport of raw materials to manufacturer

The transportation of the suppliers to Adfil N.V. is done by truck.

A3. Manufacturing

The production process begins with extrusion, during which the required plastics are combined and processed. After extrusion, the hardened material is cut to the desired dimensions. The products then undergo a quality control process to check for production defects. After production, the various products are packaged in foil and paper bags. Throughout the entire manufacturing process, only electricity is used as the energy source. The process results in a production loss of 4.49%. During production, only electricity consumption occurs. The specified electricity consumption covers the electricity usage of all machines and equipment. For electricity purposes the following reference was selected: Electricity, high voltage {BE}| market for with 0,244 kg GWP per KWh.

DECLARATION OF SVHC

None of the substances contained in the product are listed in the “Candidate List of Substances of Very High Concern for authorisation”, or they do not exceed the threshold with the European Chemicals Agency.

REFERENCES

ISO. (2006). 'ISO 14044: Environmental management - Life cycle assessment - Requirements and guidelines', International Organization for Standardization, ISO14044:2006.

ISO. (2006). 'ISO 14040: Environmental management - Life cycle assessment – Principles and Framework', International Organization for Standardization, ISO14040:2006.

ISO. (2006). 'ISO 14025: Environmental labels and declarations -- Type III environmental declarations -- Prin-ciples and procedures', International Organization for Standardization, ISO14025:2006.

NMD. (2022). Bepalingsmethode ‘Milieuprestatie Bouwwerken’ versie 1.1 inclusief de bijbehorende wijzigingsbladen.

CE Delft. (2010). Handboek Schaduwprijzen. Opgehaald van https://ce.nl/publicaties/handboek-schaduwprijzen-waardering-en-weging-van-emissies-en-milieueffecten/

TNO. (sd). Toxiciteit heeft z'n prijs : schaduwprijzen voor (eco-)toxiciteit en uitputting van abiotische grondstoffen binnen DuboCalc. Opgehaald van https://puc.overheid.nl/rijkswaterstaat/doc/PUC_119145_31/

SimaPro. (2023). Home. Opgehaald van SimaPro: https://simapro.com/

NMD. (2022, Mei). Forfaitaire waarden voor verwerking-scenario’s einde leven behorende bij: Bepalingsmethode Milieuprestatie Bouwwerken.Opgehaald van Milieudatabase: https://milieudatabase.nl/wp-content/uploads/2022/05/Forfaitaire_waarden_mei_2022.pdf

SBR. (2011, 11 14). SBR Publicatie Levensduren

NEN. (2019). 'NEN-EN 15804+A2: Duurzaamheid van bouwwerken - Milieuverklaringen van producten - Basisregels voor de productgroep bouwproducten', NEN-EN 15804:2012+A2:2019.

Journal of Materials Science. (2009). Structural and thermal properties of PVDF/PVA blends. Journal of Materials Science. Opgehaald van Structural and thermal properties of PVDF/PVA blends: https://link.springer.com/article/10.1007/s10853-009-3271-8

NMD. (2024, Juni). Wijzigingsblad Amendement 4 bij Bepalingsmethode 1.1. Opgehaald van milieudatabase.nl: https://milieudatabase.nl/nl/milieuprestatie/bepalingsmethode/

REMARKS

EPD of construction products may not be comparable if they do not comply with EN15804.