SENTINEL HOLDING
INSTITUT

# SHI-PRODUKTPASS

**Produkte finden - Gebäude zertifizieren**

SHI-Produktpass-Nr.:

**15557-10-1002**

# dBlue

Warengruppe: Entwässerung / Rohre - Rohrsysteme / Fittinge - Installation

MARLEY

Marley Deutschland GmbH
Adolf-Oesterheld-Str. 28
31515 Wunstorf

## Produktqualitäten:

- QNG Qualitätssiegel Nachhaltiges Gebäude ✓
- DGNB NEUBAU 2023 ✓
- DGNB NEUBAU 2018 ✓
- BNB-BN NEUBAU V2015 ✓
- EU-Taxonomie ✓
- BREEAM DE NEUBAU 2018 ✓
- LEED v4.1 (outside US) ✓

GEPRÜFT NACHHALTIGES PRODUKT
SHI PRODUKT PASS
SENTINEL HOLDING INSTITUT
www.sentinel-holding.eu

Köttner

**Helmut Köttner**
Wissenschaftlicher Leiter
Freiburg, den 02.03.2026

Produkt:
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# Inhalt



Wir sind stolz darauf, dass die SHI-Datenbank, die erste und einzige Datenbank für Bauprodukte ist, die ihre umfassenden Prozesse sowie die Aktualität regelmäßig von dem unabhängigen Prüfunternehmen SGS-TÜV Saar überprüfen lässt.

SGS

SGS TÜV SAAR

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# QNG - Qualitätssiegel Nachhaltiges Gebäude

Das Qualitätssiegel Nachhaltiges Gebäude, entwickelt durch das Bundesministerium für Wohnen, Stadtentwicklung und Bauwesen (BMWSB), legt Anforderungen an die ökologische, soziokulturelle und ökonomische Qualität von Gebäuden fest. Das Sentinel Holding Institut prüft Bauprodukte gemäß den QNG-Anforderungen für eine Zertifizierung und vergibt das QNG-ready Siegel. Das Einhalten des QNG-Standards ist Voraussetzung für den KfW-Förderkredit. Für bestimmte Produktgruppen hat das QNG derzeit keine spezifischen Anforderungen definiert. Diese Produkte sind als nicht bewertungsrelevant eingestuft, können jedoch in QNG-Projekten genutzt werden.

| Kriterium | Pos. / Bauproduktgruppe | Betrachtete Stoffe | QNG Freigabe |
|---|---|---|---|
| 3.1.3 Schadstoffvermeidung in Baumaterialien | nicht zutreffend | nicht zutreffend | QNG-ready nicht bewertungsrelevant |

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# DGNB Neubau 2023

Das DGNB-System (Deutsche Gesellschaft für Nachhaltiges Bauen) bewertet die Nachhaltigkeit von Gebäuden verschiedener Art. Das System ist sowohl anwendbar für private und gewerbliche Großprojekte als auch für kleinere Wohngebäude. Die Version 2023 setzt hohe Standards für ökologische, ökonomische, soziokulturelle und funktionale Aspekte während des gesamten Lebenszyklus eines Gebäudes.

| Kriterium | Pos. / Relevante Bauteile / Bau-Materialien / Flächen | Betrachtete Stoffe / Aspekte | Qualitätsstufe |
|---|---|---|---|
| ENV 1.2 Risiken für die lokale Umwelt, 03.05.2024 (3. Auflage) | nicht zutreffend | | nicht bewertungsrelevant |

| Kriterium | Pos. / Relevante Bauteile / Bau-Materialien / Flächen | Betrachtete Stoffe / Aspekte | Qualitätsstufe |
|---|---|---|---|
| ENV 1.2 Risiken für die lokale Umwelt, 29.05.2025 (4. Auflage) | nicht zutreffend | | nicht bewertungsrelevant |

Produkt:
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# DGNB Neubau 2018

Das DGNB-System (Deutsche Gesellschaft für Nachhaltiges Bauen) bewertet die Nachhaltigkeit von Gebäuden verschiedener Art. Das System ist sowohl anwendbar für private und gewerbliche Großprojekte als auch für kleinere Wohngebäude.

| Kriterium | Pos. / Relevante Bauteile / Bau-Materialien / Flächen | Betrachtete Stoffe / Aspekte | Qualitätsstufe |
|---|---|---|---|
| ENV 1.2 Risiken für die lokale Umwelt | nicht zutreffend | nicht zutreffend | nicht bewertungsrelevant |

Produkt:
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# BNB-BN Neubau V2015

Das Bewertungssystem Nachhaltiges Bauen ist ein Instrument zur Bewertung von Büro- und Verwaltungsgebäuden, Unterrichtsgebäuden, Laborgebäuden sowie Außenanlagen in Deutschland. Das BNB wurde vom damaligen Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB) entwickelt und unterliegt heute dem Bundesministerium für Wohnen, Stadtentwicklung und Bauwesen.

| Kriterium | Pos. / Bauprodukttyp | Betrachtete Schadstoffgruppe | Qualitätsniveau |
|---|---|---|---|
| 1.1.6 Risiken für die lokale Umwelt | | | nicht bewertungsrelevant |

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# EU-Taxonomie

Die EU-Taxonomie klassifiziert wirtschaftliche Aktivitäten und Produkte nach ihren Umweltauswirkungen. Auf der Produktebene gibt es gemäß der EU-Verordnung klare Anforderungen zu Formaldehyd und flüchtigen organischen Verbindungen (VOC). Die Sentinel Holding Institut GmbH kennzeichnet qualifizierte Produkte, die diesen Standard erfüllen.

| Kriterium | Produkttyp | Betrachtete Stoffe | Bewertung |
|---|---|---|---|
| DNSH - Vermeidung und Verminderung der Umweltverschmutzung | | Stoffe nach Anlage C | EU-Taxonomie konform |
| **Nachweis:** REACH-Erklärung Oleśnica, 29th October 2025 | | | |

Produkt:
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# BREEAM DE Neubau 2018

BREEAM (Building Research Establishment Environmental Assessment Methodology) ist ein britisches Gebäudebewertungssystem, welches die Nachhaltigkeit von Neubauten, Sanierungsprojekten und Umbauten einstuft. Das Bewertungssystem wurde vom Building Research Establishment (BRE) entwickelt und zielt darauf ab, ökologische, ökonomische und soziale Auswirkungen von Gebäuden zu bewerten und zu verbessern.

| Kriterium | Produktkategorie | Betrachtete Stoffe | Qualitätsstufe |
|---|---|---|---|
| Hea 02 Qualität der Innenraumluft | | | nicht bewertungsrelevant |

Produkt:
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# LEED v4.1

LEED (Leadership in Energy and Environmental Design) ist ein international anerkanntes Gebäudezertifizierungssystem des U.S. Green Building Council. Es zählt zu den weltweit am weitesten verbreiteten Nachhaltigkeitsstandards für Gebäude und wird insbesondere bei international ausgerichteten Projekten eingesetzt. LEED bewertet Gebäude ganzheitlich in Kategorien wie Energieeffizienz, Ressourcenschonung, Materialauswahl, Innenraumqualität und Standortqualität. Je nach erreichter Punktzahl werden die Zertifizierungsstufen LEED Certified, Silver, Gold oder Platinum vergeben.

| Kriterium | Produktkategorie | Bewertung |
|---|---|---|
| EQ Credit: Low-Emitting Materials | | nicht bewertungsrelevant |

Produkt:
**dBlue**

SHI Produktpass-Nr.:
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# Produktsiegel

In der Baubranche spielt die Auswahl qualitativ hochwertiger Materialien eine zentrale Rolle für die Gesundheit in Gebäuden und deren Nachhaltigkeit. Produktlabels und Zertifikate bieten Orientierung, um diesen Anforderungen gerecht zu werden. Allerdings besitzt jedes Zertifikat und Label eigene Prüfkriterien, die genau betrachtet werden sollten, um sicherzustellen, dass sie den spezifischen Bedürfnissen eines Bauvorhabens entsprechen.

Produkte mit dem QNG-ready Siegel des Sentinel Holding Instituts eignen sich für Projekte, für welche das Qualitätssiegel Nachhaltiges Gebäude (QNG) angestrebt wird. QNG-ready Produkte erfüllen die Anforderungen des QNG Anhangdokument 3.1.3 "Schadstoffvermeidung in Baumaterialien". Das KfW-Kreditprogramm Klimafreundlicher Neubau mit QNG kann eine höhere Fördersumme ermöglichen.

EPD Hub ist ein globales EPD-Programm, das den gesamten Prozess von der Datenerfassung über die Verifizierung bis zur Veröffentlichung von Environmental Product Declarations (EPDs) digitalisiert und effizient gestaltet. EPD Hub arbeitet nach international anerkannten Standards wie ISO 14025, EN 15804 + A2 und ISO 21930, und verwendet eigene feste Regelwerke (GPI und PCR), um eine einheitliche Methodik zu sichern.

Produkt:
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# Rechtliche Hinweise

(*) Die Kriterien dieses Steckbriefs beziehen sich auf das gesamte Bauobjekt. Die Bewertung erfolgt auf der Ebene des Gebäudes. Im Rahmen einer sachgemäßen Planung und fachgerechten Installation können einzelne Produkte einen positiven Beitrag zum Gesamtergebnis der Bewertung leisten. Das Sentinel Holding Institut stützt sich einzig auf die Angaben des Herstellers.

**Alle Kriterien finden Sie unter:**
**https://www.sentinel-holding.eu/de/Themenwelten/Pr%C3%BCfkriterien%20f%C3%BCr%20Produkte**

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SGS TÜV SAAR

## Herausgeber

Sentinel Holding Institut GmbH
Bötzinger Str. 38
79111 Freiburg im Breisgau
Tel.: +49 761 590 481-70
info@sentinel-holding.eu
www.sentinel-holding.eu

## Unsere Schallschutzlösung

**Schalldämmende Rohre**
zur Luftschalldämmung

+

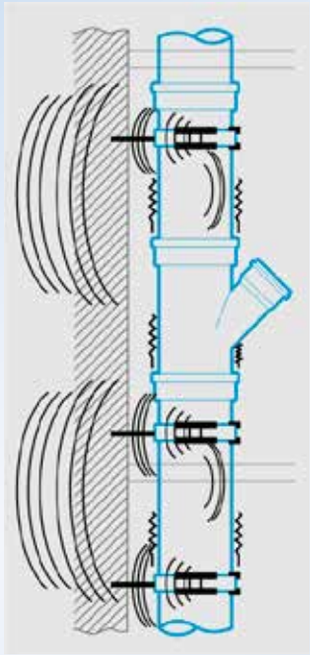
**Schalldämmende Formteile**
zur Luftschalldämmung

+

**Schalldämmende Befestigungsschellen**
zur Körperschalldämmung

=

**Komplettes System**



## Vorteile auf einen Blick

- Hochschalldämmende Eigenschaften
- Erfüllt schallschutztechnische Anforderungen der DIN 4109 und VDI 4100
- Optimale Strömung von Flüssigkeiten durch äußerst glatte und gleitfähige Innenschicht
- Erhöhte Verlegefreundlichkeit durch zähe Außenschicht
- Kälteschlagzähigkeit, Verlegesicherheit bei niedrigen Temperaturen
- Abmessungen DN 50 bis DN 110 nach DIN EN 1451-1
- Ablängen mit Rohrabschneidern für Kunststoffrohre oder Feinsäge
- Steckmuffenverbindung
- Werkseitig eingelegte Dichtringe
- Anschluss an herkömmliche HT- und KG-Rohre ohne spezielle Übergangsstücke
- Umweltfreundlich, da recyclebar

NEU

dBlue

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## Das Sortiment

- Rohre
- Bögen
- Einfachabzweige
- Doppelabzweige
- Eckabzweige
- Übergangsrohre
- Langmuffen
- Überschiebemuffen
- Reinigungsrohre
- Muffenstopfen
- Schellen

## Zertifizierte Qualität

Deutschland · Australien · Schweden · Dänemark · Polen

Fraunhofer IBP
EN14366 Schallmessung von Luft-/Körperschall

EN13501 Bestimmung der Brandschutzklasse

ISO 9001 Qualitäts-Managementsystem

ISO 14001 Umwelt-Managementsystem

Deutsches Institut für Bautechnik DIBt

MARLEY
Marley Deutschland GmbH
Adolf-Oesterheld-Str. 28
31515 Wunstorf
Telefon +49.(0)5031.53-0
Telefax +49.(0)5031.53-371
**www.marley.de**

02/25 · 912134 · Technische Änderungen vorbehalten.

# dBlue schalldämmendes Abwassersystem

### Innovativ. Schalldämmend. Komplett.

- Rohre und Formstücke aus mineralverstärktem PP-MD
- Abmessungen DN 50 bis DN 110 nach DIN EN 1451-1
- Anschluss an herkömmliche HT- und KG-Rohre ohne spezielle Übergangsstücke
- Kälteschlagzähigkeit, Verlegesicherheit bei niedrigen Temperaturen
- Umweltfreundlich, da recyclebar

**Mach's mit Marley.**

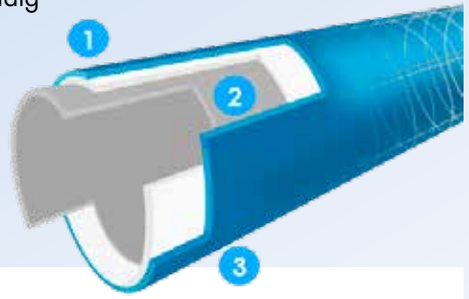
# dBlue schalldämmendes Abwassersystem – Entwässerungssystem für höchste Anforderungen

## Mehrschichttechnologie

**1 Innenschicht – PP grau**
- abriebfest
- hochgleitfähig
- temperaturbeständig
- chemikalienbeständig

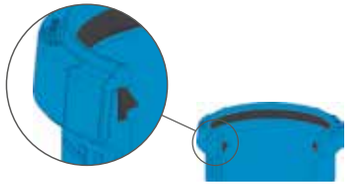
**2 Mittelschicht – PP-MD**
- mineralverstärkt
- hochsteif
- schalldämmend

**3 Außenschicht – PP blau, RAL 5012**
- schlagfest
- witterungsbeständig
- bruchsicher bis -10°C

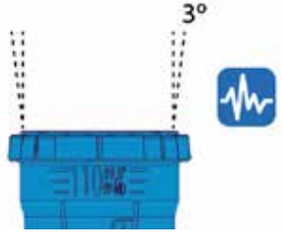



## Formteile

- Vollgespritzt aus mineralverstärktem PP-MD = Weniger Geräusche
- Kompakter Wandaufbau
- Snap-Cap Technologie
- Winkelkennzeichnungen zur einfachen Montage (45° Intervalle)



- Werkseitig eingelegte Dichtringe
  - Reduzierung von Vibration
  - Reduzierung von Spannung
  - Schnelle und einfache Montage
  - Keine elektrischen Werkzeuge notwendig

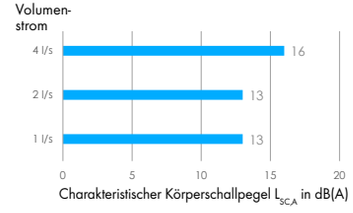


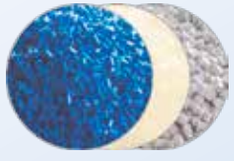

| Technische Daten | |
|---|---|
| **Werkstoff** | PP-MD mineralverstärkt (Rohre und Formstücke) |
| **Farbe** | Blau, RAL 5012 |
| **Abmessungen** | DN 50, DN 75, DN 90, DN 110 |
| **Einsatzbereich** | Druckloses häusliches Abwasser mit pH-Wert 2 – 12 |
| **Anwendungskennzeichen** | BD: Innerhalb und unterhalb der Gebäudestruktur |
| **Temperaturbeständigkeit** | Dauerbelastung: 90 °C<br>Kurzzeitig: 95 °C |
| **Min. Verarbeitungstemperatur** | -10 °C |
| **Dichte** | Rohre: 1,1 – 1,3 g/cm³<br>Formstücke: 1,1 – 1,4 g/cm³ |
| **Längenausdehnungskoeffizient** | 0,10 mm/mK |
| **Ringsteifigkeit** | 4,0 kN/m² (SN4) |
| **Dichtungen** | SBR nach DIN EN 681-1 |
| **Schallverhalten nach DIN EN 14366** | P-BA 124/2020: 16 dB(A) bei 4 l/s (mit dBlue Schelle) |
| **Brandverhalten** | B2 (normal entflammbar) nach DIN 4102<br>E (normal entflammbar) nach EN 13501-1 |
| **Verwendbarkeitnachweis** | abZ Z-42.1-399: Allgemeine bauaufsichtliche Zulassung (DIBt) |
| **Prüfungen** | Systemprüfung in Anlehnung an DIN EN 1451-1<br>„Eiskristall" nach DIN EN 1451-1 und DIN EN 1411 |

### Prüfergebnisse des Fraunhofer-Instituts der Bauphysik, Stuttgart (IBP)

- Befestigung mit dBlue Befestigungsschellen inkl. Kunststoffeinleger
- Mit **16 db(A)** bei **4 l/s** Volumenstrom erfüllt dBlue die Anforderungen der **DIN 4109** sowie die verschärften Anforderungen der **VDI 4100**

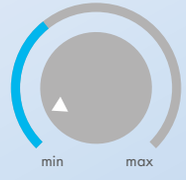
Messergebnisse nach EN14366 (P-BA 124/2020)



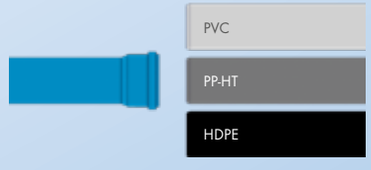



Hochmoderne Materialformel

Mehrschicht-technologie




Hoch-schalldämmend




Einfacher Übergang zu PVC, PP-HT und HDPE ohne zusätzliche Übergangsfittings

**Mach's mit Marley.**


# ENVIRONMENTAL PRODUCT DECLARATION

## IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

**dBlue Acoustic Soil & Waste System**

Aliaxis Poland Sp. z o.o.

**EPD HUB, HUB-1997**

Publishing date 06 October 2024, last updated on 06 October 2024, valid until 06 October 2029.

Created with One Click LCA

# GENERAL INFORMATION

## MANUFACTURER

| | |
|---|---|
| Manufacturer | Aliaxis Poland Sp. z o.o. |
| Address | ul. Energetyczna 6 56-400 Oleśnica (Poland) |
| Contact details | biuro.pl@aliaxis.com |
| Website | www.aliaxis.pl |

## EPD STANDARDS, SCOPE AND VERIFICATION

| | |
|---|---|
| Program operator | EPD Hub, hub@epdhub.com |
| Reference standard | EN 15804+A2:2019 und ISO 14025 |
| PCR | EPD Hub Core PCR Version 1.1, 5 Dec 2023<br>EN 16904 Product Category Rules (PCR) for plastics piping systems inside buildings |
| Sector | Construction product |
| Category of EPD | Third party verified EPD |
| Scope of the EPD | Cradle to gate with options, A4-A5, and modules C1-C4, D |
| EPD author | Lemonnier Elisa |
| EPD verification | Independent verification of this EPD and data, according to ISO 14025:<br>☐ Internal verification ☑ External verification |
| EPD verifier | Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited |

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

## PRODUCT

| | |
|---|---|
| Product name | dBlue Acoustic Soil & Waste System |
| Additional labels | - |
| Product reference | - |
| Place of production | Oleśnica, Poland |
| Period for data | 01/01/2023 - 31/12/2023 |
| Averaging in EPD | No averaging |

## ENVIRONMENTAL DATA SUMMARY

| | |
|---|---|
| **Declared unit** | 1 m |
| **Declared unit mass** | 1.473 kg |
| **GWP-fossil, A1-A3 ($kgCO_2e$)** | 4.31E+00 |
| **GWP-total, A1-A3 ($kgCO_2e$)** | 4.00E+00 |
| **Secondary material, inputs (%)** | 2.13 |
| **Secondary material, outputs (%)** | 17 |
| **Total energy use, A1-A3 (kWh)** | 20.6 |
| **Net freshwater use, A1-A3 ($m^3$)** | 0.07 |

# PRODUCT AND MANUFACTURER

## ABOUT THE MANUFACTURER

**The Aliaxis Group**

Driven by passion, we create sustainable, innovative solutions for water and power supply. We provide to people all over the planet innovating plastic piping systems by operating our business to stay future-proof for the growing needs of our customers.

We're local at heart and global in spirit!

We leverage the global perspective of the Aliaxis Group to support our local activities. The sum of local experiences allows us to create solutions beneficial to the customers around the world. We have over 100 distribution centers and more than 75 production plants in over 40 countries. Every day, over 15.500 of our team members passionately and responsibly create and deliver reliable solutions to our customers.

## PRODUCT DESCRIPTION

dBlue is a purpose-designed sound reducing drainage system made from a state-of-the-art combination of PP polymer and sound absorbing mineral filler (PP-MD) to maximize absorbance of sound. Used in conjunction with the acoustic pipe brackets, the acoustic system is designed to reduce noise and acoustic vibrations, which makes it is suitable for use in multi-occupancy applications as well as hospitals, hotels and other commercial applications, where reduced noise levels are preferred. It is also lightweight, resistant to temperature change and is jointed using the push-fit ring seal method.

The triple-layer pipe structure is produced using the latest co-extrusion technology. Each layer has its own function optimised to reduce sound levels, increase mechanical characteristics and improve the drainage flow. The dBlue system is resistant to hot waste water flow and can also be installed at extremely low temperatures in winter. The pipe has been manufactured in three colours, to distinguish the different layers. dBlue acoustic fittings combine many unique technical and practical properties. The fittings are produced in a compact version and are classified as products of high area of mechanical resistance.

dBlue offers a versatile system with a superior application range. It will reach from the highest point in a skyscraper to the exit point of the building structure. dBlue system has the diameter range (40-200 mm), special fittings, acoustic performance, resistance, ring stiffness and installation advantage that makes it useable at any place in the building.

Further information can be found at: www.dblueacousticdrainage.com or www.aliaxis.pl.

## PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass % | Material origin |
|---|---|---|
| Minerals | 24.3 | Europe |
| Fossil materials | 63.3 | Europe |
| Internally re-granulated materials (pipes) | 9.2 | Europe |
| Bio-based materials | 0 | - |
| Metals (for bracketing) | 3.2 | Europe |

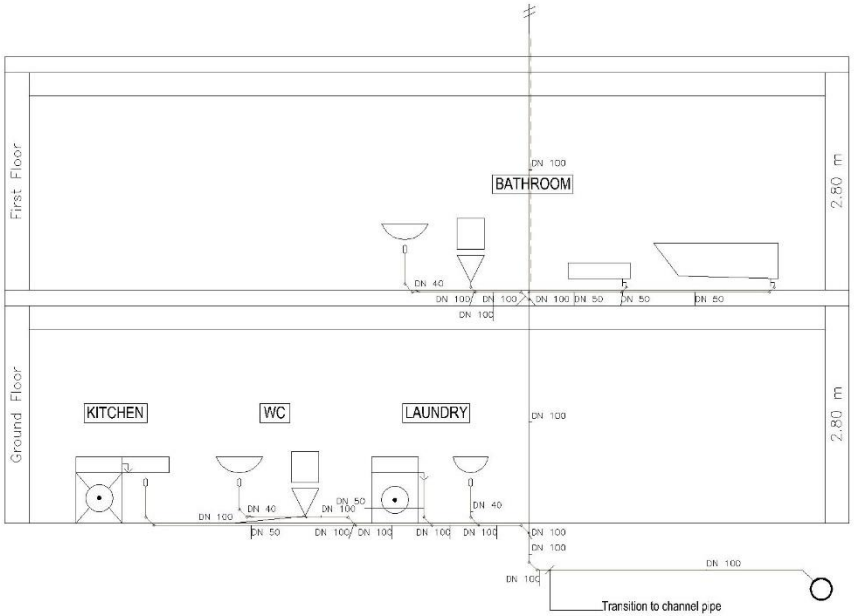
## BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

| | |
|---|---|
| Biogenic carbon content in product, kg C | 0 |
| Biogenic carbon content in packaging, kg C | 0.0123 |

## FUNCTIONAL UNIT AND SERVICE LIFE

| | |
|---|---|
| Declared unit | 1 m |
| Mass per declared unit | 1.473 kg |
| Functional unit | The functional unit represents 100 m² of a typical detached house, incorporating a bathroom, a separate WC, one kitchen and laundry room. |
| Reference service life | - |




*Functional unit representation*

## SUBSTANCES, REACH - VERY HIGH CONCERN

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

# PRODUCT LIFE-CYCLE

## SYSTEM BOUNDARY

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

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

*Modules not declared = MND. Modules not relevant = MNR*

## MANUFACTURING AND PACKAGING (A1-A3)

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

The pipes are made through co-extrusion. Co-extrusion involves running two or more extruders simultaneously to produce a single, multi-layered extruded tube. The process starts with feeding raw materials into extruders where they are heated and melted. Each extruder feeds a different material into a co-extrusion die head. The die head combines these materials to create a multi-layered structure with distinct layers. Once sheared off the die face, the extruded pipe undergoes calibration and cooling to reach the desired dimensions. It then moves to a cutting station where it is cut into required

lengths. The pipe sections are passed to the socketing machines that create the sockets at the pipe ends through plastic deformation. Ring seals are inserted into these sockets. The finished product is then packed for storage and shipment.

Fittings are manufactured through injection molding. The process begins with heating raw material until it melts. The molten material is then injected into a mold, which is shaped to match the specific design of the fitting. Once injected, the molten material quickly cools within the mold. As the material solidifies, it takes on the desired shape, including threads, grooves, and other essential features. After cooling, the mold opens, revealing the newly formed fitting. Ring seals are then inserted into the sockets. Once inspected and approved, the finished fitting is packed, ready for storage and shipment.

## TRANSPORT AND INSTALLATION (A4-A5)

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

The transportation distance from manufacturing site to the building site corresponds to an average transport distance based on Aliaxis Poland sales. The transportation method used is lorry. The packaging waste are taken into account in the installation section (A5).

## PRODUCT USE AND MAINTENANCE (B1-B7)

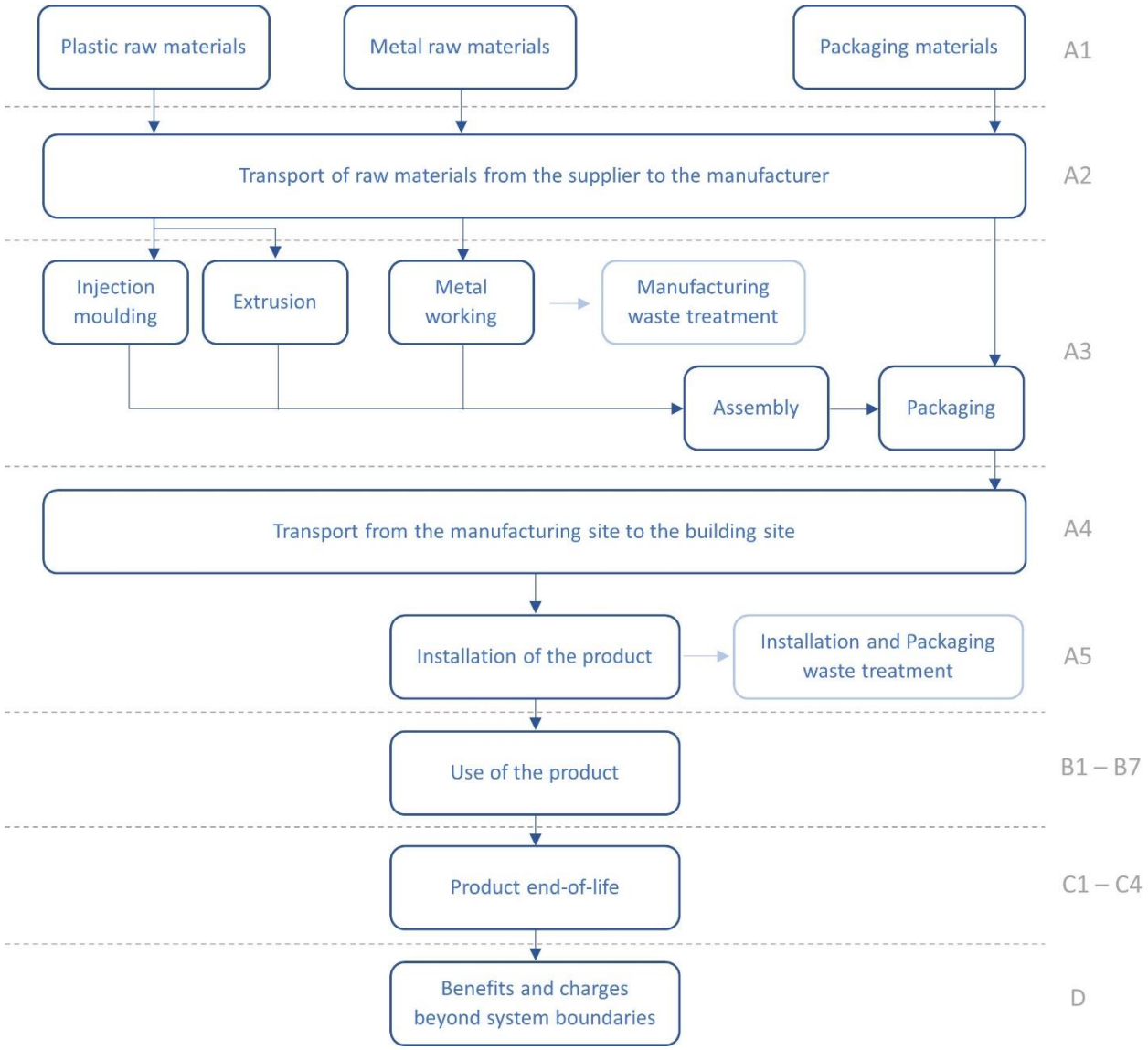
This EPD does not cover the use phase.
Air, soil, and water impacts during the use phase have not been studied.

## PRODUCT END OF LIFE (C1-C4, D)

The end-of-life product materials are transported by lorry to several facilities: a recycling facility 800 km from the demolition site, an incineration facility 150 km away and a landfill facility 50 km away (C2). The PP is collected from the demolition site: 36.8% is sent for incineration, 18.3% is recycled and 44.9% is landfilled. The EPDM is collected from the demolition site: 45% is sent for incineration and 55% is landfilled. 100% of the steel is landfilled (C3 - C4).

The benefits and loads of PP recycling are considered in module D. The energy and heat produced by the incineration of EPDM, PP and of waste packaging materials are also taken into account in module D.

# FLOW DIAGRAM



# LIFE-CYCLE ASSESSMENT

## CUT-OFF CRITERIA

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

## ALLOCATION, ESTIMATES AND ASSUMPTIONS

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

| Data type | Allocation |
|---|---|
| Raw materials | No allocation |
| Packaging material | No allocation |
| Ancillary materials | No allocation |
| Manufacturing energy and waste | Allocation according to weight or volume |

## AVERAGES AND VARIABILITY

| | |
|---|---|
| Type of average | No average |
| Averaging method | Not applicable |

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

## LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data.

# ENVIRONMENTAL IMPACT DATA

## CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP – total[1)] | kg $CO_2e$ | 2,74E+00 | 1,23E-01 | 1,13E+00 | 4,00E+00 | 9,31E-01 | 4,12E-01 | MND | MND | MND | MND | MND | MND | MND | MNR | 2,95E-02 | 1,37E+00 | 8,03E-02 | -3,86E+00 |
| GWP – fossil | kg $CO_2e$ | 2,74E+00 | 1,23E-01 | 1,45E+00 | 4,31E+00 | 9,31E-01 | 9,18E-02 | MND | MND | MND | MND | MND | MND | MND | MNR | 2,95E-02 | 1,37E+00 | 8,03E-02 | -2,10E+00 |
| GWP – biogenic | kg $CO_2e$ | 0,00E+00 | 0,00E+00 | -3,20E-01 | -3,20E-01 | 0,00E+00 | 3,20E-01 | MND | MND | MND | MND | MND | MND | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | -1,76E+00 |
| GWP – LULUC | kg $CO_2e$ | 1,00E-03 | 4,52E-05 | 1,03E-03 | 2,07E-03 | 3,43E-04 | 5,25E-06 | MND | MND | MND | MND | MND | MND | MND | MNR | 1,09E-05 | 5,11E-06 | 7,77E-06 | 8,76E-04 |
| Ozone depletion pot. | kg $CFC\text{-}_{11}e$ | 1,04E-07 | 2,82E-08 | 6,65E-08 | 1,98E-07 | 2,14E-07 | 1,68E-09 | MND | MND | MND | MND | MND | MND | MND | MNR | 6,79E-09 | 1,21E-09 | 2,18E-09 | -4,88E-08 |
| Acidification potential | mol $H^+e$ | 1,12E-02 | 5,19E-04 | 9,53E-03 | 2,12E-02 | 3,94E-03 | 9,65E-05 | MND | MND | MND | MND | MND | MND | MND | MNR | 1,25E-04 | 1,82E-04 | 6,35E-05 | -1,42E-02 |
| EP-freshwater[2)] | kg Pe | 6,86E-05 | 1,00E-06 | 1,61E-04 | 2,31E-04 | 7,62E-06 | 9,00E-07 | MND | MND | MND | MND | MND | MND | MND | MNR | 2,42E-07 | 1,73E-07 | 2,55E-07 | -1,78E-04 |
| EP-marine | kg Ne | 1,89E-03 | 1,54E-04 | 1,30E-03 | 3,34E-03 | 1,17E-03 | 4,78E-05 | MND | MND | MND | MND | MND | MND | MND | MNR | 3,71E-05 | 8,47E-05 | 6,80E-05 | -1,72E-03 |
| EP-terrestrial | mol Ne | 2,15E-02 | 1,70E-03 | 1,34E-02 | 3,66E-02 | 1,29E-02 | 2,61E-04 | MND | MND | MND | MND | MND | MND | MND | MNR | 4,10E-04 | 9,17E-04 | 2,31E-04 | -1,88E-02 |
| POCP ("smog")[3)] | kg NMVOCe | 9,04E-03 | 5,44E-04 | 3,78E-03 | 1,34E-02 | 4,14E-03 | 8,19E-05 | MND | MND | MND | MND | MND | MND | MND | MNR | 1,31E-04 | 2,22E-04 | 8,92E-05 | -5,89E-03 |
| ADP-minerals & metals4) | kg Sbe | 4,43E-03 | 2,87E-07 | 2,29E-06 | 4,43E-03 | 2,18E-06 | 2,75E-08 | MND | MND | MND | MND | MND | MND | MND | MNR | 6,92E-08 | 5,15E-08 | 2,50E-08 | -3,81E-06 |
| ADP-fossil resources | MJ | 8,71E+01 | 1,84E+00 | 1,81E+01 | 1,07E+02 | 1,40E+01 | 1,83E-01 | MND | MND | MND | MND | MND | MND | MND | MNR | 4,43E-01 | 1,34E-01 | 1,68E-01 | -3,49E+01 |
| Water use[5)] | $m^3e$ depr. | 1,35E+00 | 8,23E-03 | 3,57E-01 | 1,71E+00 | 6,26E-02 | 8,29E-03 | MND | MND | MND | MND | MND | MND | MND | MNR | 1,98E-03 | 4,62E-02 | 1,02E-03 | -3,65E-01 |

*1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.*

## ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Particulate matter | Incidence | 1,18E-07 | 1,41E-08 | 3,06E-08 | 1,63E-07 | 1,07E-07 | 9,83E-10 | MND | MND | MND | MND | MND | MND | MND | MNR | 3,40E-09 | 9,37E-10 | 1,23E-09 | -7,30E-08 |
| Ionizing radiation[6)] | kBq U235e | 1,81E-01 | 8,76E-03 | 4,99E-02 | 2,39E-01 | 6,66E-02 | 6,98E-04 | MND | MND | MND | MND | MND | MND | MND | MNR | 2,11E-03 | 2,87E-04 | 8,22E-04 | -3,80E-02 |
| Ecotoxicity (freshwater) | CTUe | 6,95E+01 | 1,66E+00 | 2,01E+01 | 9,13E+01 | 1,26E+01 | 2,86E-01 | MND | MND | MND | MND | MND | MND | MND | MNR | 3,99E-01 | 4,40E-01 | 3,00E-01 | -2,54E+01 |
| Human toxicity, cancer | CTUh | 6,29E-09 | 4,07E-11 | 7,15E-10 | 7,05E-09 | 3,09E-10 | 1,06E-11 | MND | MND | MND | MND | MND | MND | MND | MNR | 9,80E-12 | 4,88E-11 | 5,99E-12 | -7,00E-10 |
| Human tox. non-cancer | CTUh | 3,76E-08 | 1,64E-09 | 2,22E-08 | 6,14E-08 | 1,25E-08 | 4,77E-10 | MND | MND | MND | MND | MND | MND | MND | MNR | 3,95E-10 | 1,82E-09 | 1,38E-10 | -2,64E-08 |
| SQP[7)] | - | 4,86E+00 | 2,12E+00 | 2,14E+01 | 2,84E+01 | 1,61E+01 | 1,64E-01 | MND | MND | MND | MND | MND | MND | MND | MNR | 5,11E-01 | 4,41E-02 | 3,99E-01 | -6,73E+00 |

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

## USE OF NATURAL RESOURCES

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Renew. PER as energy[8)] | MJ | 2,12E+00 | 2,07E-02 | 2,94E+00 | 5,08E+00 | 1,58E-01 | 6,78E-03 | MND | MND | MND | MND | MND | MND | MND | MNR | 4,99E-03 | 3,34E-03 | 3,28E-03 | -1,46E+00 |
| Renew. PER as material | MJ | 0,00E+00 | 0,00E+00 | 2,78E+00 | 2,78E+00 | 0,00E+00 | -2,78E+00 | MND | MND | MND | MND | MND | MND | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,53E+01 |
| Total use of renew. PER | MJ | 2,12E+00 | 2,07E-02 | 5,73E+00 | 7,86E+00 | 1,58E-01 | -2,78E+00 | MND | MND | MND | MND | MND | MND | MND | MNR | 4,99E-03 | 3,34E-03 | 3,28E-03 | 1,38E+01 |
| Non-re. PER as energy | MJ | 4,99E+01 | 1,84E+00 | 1,72E+01 | 6,89E+01 | 1,40E+01 | 1,83E-01 | MND | MND | MND | MND | MND | MND | MND | MNR | 4,43E-01 | 1,34E-01 | 1,68E-01 | -2,62E+01 |
| Non-re. PER as material | MJ | 3,72E+01 | 0,00E+00 | 8,83E-01 | 3,81E+01 | 0,00E+00 | -8,83E-01 | MND | MND | MND | MND | MND | MND | MND | MNR | 0,00E+00 | -2,04E+01 | -1,69E+01 | 1,22E+01 |
| Total use of non-re. PER | MJ | 8,71E+01 | 1,84E+00 | 1,81E+01 | 1,07E+02 | 1,40E+01 | -6,99E-01 | MND | MND | MND | MND | MND | MND | MND | MNR | 4,43E-01 | -2,03E+01 | -1,67E+01 | -1,40E+01 |
| Secondary materials | kg | 3,14E-02 | 5,11E-04 | 1,01E-01 | 1,33E-01 | 3,88E-03 | 6,56E-05 | MND | MND | MND | MND | MND | MND | MND | MNR | 1,23E-04 | 2,24E-04 | 5,93E-05 | 2,93E-01 |
| Renew. secondary fuels | MJ | 8,05E-04 | 5,16E-06 | 5,97E-02 | 6,05E-02 | 3,92E-05 | 7,43E-07 | MND | MND | MND | MND | MND | MND | MND | MNR | 1,24E-06 | 1,25E-06 | 2,23E-06 | -2,09E-02 |
| Non-ren. secondary fuels | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Use of net fresh water | $m^3$ | 3,49E-02 | 2,38E-04 | 3,64E-02 | 7,15E-02 | 1,81E-03 | 2,29E-04 | MND | MND | MND | MND | MND | MND | MND | MNR | 5,74E-05 | 1,74E-04 | 1,79E-04 | -4,13E-02 |

*8) PER = Primary energy resources.*

## END OF LIFE – WASTE

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hazardous waste | kg | 3,09E-01 | 2,44E-03 | 1,44E-01 | 4,55E-01 | 1,85E-02 | 8,00E-04 | MND | MND | MND | MND | MND | MND | MND | MNR | 5,88E-04 | 0,00E+00 | 0,00E+00 | -1,70E-01 |
| Non-hazardous waste | kg | 3,99E+00 | 4,01E-02 | 7,07E+00 | 1,11E+01 | 3,05E-01 | 2,29E-01 | MND | MND | MND | MND | MND | MND | MND | MNR | 9,66E-03 | 5,32E-01 | 6,94E-01 | -8,83E+00 |
| Radioactive waste | kg | 6,75E-05 | 1,23E-05 | 2,06E-05 | 1,00E-04 | 9,36E-05 | 5,46E-07 | MND | MND | MND | MND | MND | MND | MND | MNR | 2,97E-06 | 0,00E+00 | 0,00E+00 | -2,38E-05 |

## END OF LIFE – OUTPUT FLOWS

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Components for re-use | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Materials for recycling | kg | 0,00E+00 | 0,00E+00 | 1,41E-01 | 1,41E-01 | 0,00E+00 | 2,62E-01 | MND | MND | MND | MND | MND | MND | MND | MNR | 0,00E+00 | 5,00E-01 | 0,00E+00 | 0,00E+00 |
| Materials for energy rec | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MND | MND | MND | MND | MND | MND | MNR | 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 | 6,27E+00 | MND | MND | MND | MND | MND | MND | MND | MNR | 0,00E+00 | 6,46E+00 | 0,00E+00 | 0,00E+00 |

## ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Global Warming Pot. | kg $CO_2e$ | 2,61E+00 | 1,21E-01 | 1,43E+00 | 4,16E+00 | 9,22E-01 | 1,14E-01 | MND | MND | MND | MND | MND | MND | MND | MNR | 2,92E-02 | 1,37E+00 | 8,11E-02 | -2,04E+00 |
| Ozone depletion Pot. | kg $CFC_{-11}e$ | 8,81E-08 | 2,23E-08 | 5,40E-08 | 1,64E-07 | 1,70E-07 | 1,35E-09 | MND | MND | MND | MND | MND | MND | MND | MNR | 5,38E-09 | 1,06E-09 | 1,73E-09 | -4,02E-08 |
| Acidification | kg $SO_2e$ | 9,29E-03 | 4,03E-04 | 8,11E-03 | 1,78E-02 | 3,06E-03 | 7,72E-05 | MND | MND | MND | MND | MND | MND | MND | MNR | 9,71E-05 | 1,28E-04 | 4,84E-05 | -1,22E-02 |
| Eutrophication | kg $PO_4^3e$ | 6,01E-03 | 9,18E-05 | 5,17E-03 | 1,13E-02 | 6,98E-04 | 4,12E-04 | MND | MND | MND | MND | MND | MND | MND | MNR | 2,21E-05 | 1,11E-04 | 3,01E-03 | -5,76E-03 |
| POCP (“smog”) | kg $C_2H_4e$ | 6,14E-04 | 1,57E-05 | 3,37E-04 | 9,67E-04 | 1,20E-04 | 8,36E-06 | MND | MND | MND | MND | MND | MND | MND | MNR | 3,79E-06 | 2,35E-06 | 1,54E-05 | -5,20E-04 |
| ADP-elements | kg Sbe | 4,47E-03 | 2,78E-07 | 2,18E-06 | 4,48E-03 | 2,11E-06 | 2,61E-08 | MND | MND | MND | MND | MND | MND | MND | MNR | 6,70E-08 | 4,32E-08 | 2,41E-08 | -3,75E-06 |
| ADP-fossil | MJ | 8,71E+01 | 1,84E+00 | 1,81E+01 | 1,07E+02 | 1,40E+01 | 1,83E-01 | MND | MND | MND | MND | MND | MND | MND | MNR | 4,43E-01 | 1,34E-01 | 1,68E-01 | -3,49E+01 |

## ENVIRONMENTAL IMPACTS – FRENCH NATIONAL COMPLEMENTS

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADP-elements | kg Sbe | 4,47E-03 | 2,78E-07 | 2,18E-06 | 4,48E-03 | 2,11E-06 | 2,61E-08 | MND | MND | MND | MND | MND | MND | MND | MNR | 6,70E-08 | 4,32E-08 | 2,41E-08 | -3,75E-06 |
| Hazardous waste disposed | kg | 3,09E-01 | 2,44E-03 | 1,44E-01 | 4,55E-01 | 1,85E-02 | 8,00E-04 | MND | MND | MND | MND | MND | MND | MND | MNR | 5,88E-04 | 0,00E+00 | 0,00E+00 | -1,70E-01 |
| Non-haz. waste disposed | kg | 3,99E+00 | 4,01E-02 | 7,07E+00 | 1,11E+01 | 3,05E-01 | 2,29E-01 | MND | MND | MND | MND | MND | MND | MND | MNR | 9,66E-03 | 5,32E-01 | 6,94E-01 | -8,83E+00 |
| Air pollution | $m^3$ | 4,70E+02 | 2,20E+01 | 3,52E+02 | 8,45E+02 | 1,67E+02 | 3,46E+00 | MND | MND | MND | MND | MND | MND | MND | MNR | 5,29E+00 | 7,08E+00 | 1,96E+00 | -4,86E+02 |
| Water pollution | $m^3$ | 2,49E+01 | 1,30E-01 | 7,54E+00 | 3,26E+01 | 9,85E-01 | 4,57E-01 | MND | MND | MND | MND | MND | MND | MND | MNR | 3,12E-02 | 9,93E-01 | 3,67E+00 | -7,76E+00 |

# VERIFICATION STATEMENT

## VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

## THIRD-PARTY VERIFICATION STATEMENT

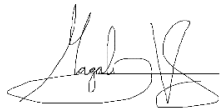
I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited
06.10.2024



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Oleśnica, 29th October 2025

To Whom It May Concern,

Aliaxis Poland hereby declares that the **dBlue system** does **not contain any Substances of Very High Concern (SVHC)** as defined by the European Chemicals Agency (ECHA) under the REACH Regulation (EC) No 1907/2006. The product is fully **compliant with REACH requirements**.

Furthermore, Aliaxis Poland confirms that **none of the following substances** are used in the manufacturing process of the dBlue system:

- Asbestos
- Lead
- Cadmium
- Chromium (including hexavalent forms)
- Mercury
- Arsenic

This declaration is made in good faith based on current knowledge and available information from our suppliers and internal processes.

Should you require any further details, please do not hesitate to contact us.

Rafał Zębik

Quality Manager,
Integrated management
System Representative

ZERTIFIKAT

SKZ service climate-neutral

SKZ Certification Body

# CONFORMITY CERTIFICATE

**Reg.-No. 4300**

Herewith we confirm in accordance with Article 18 and Article 21 of the Bavarian Building Regulations (BayBO), as published on 14 August 2007 (GVBl. p. 588 BayRS 2132-1-B), last amended by Article 4 of the Act of 25 May 2021 (GVBl. p. 286) that the building products

**Waste water pipes made of mineral filled PP**
**with three layer wall structure**
**and fittings made of mineral filled PP**
**in the nominal sizes DN 40 to DN 200 with the trade name "dBlue"**

| | |
|---|---|
| of the producer | **Aliaxis Poland Sp. z.o.o.**<br>**ul. Energetyczna 6**<br>**56-400 OLESNICA**<br>**POLAND** |
| production plant | Aliaxis Poland Sp. z.o.o.<br>ul. Energetyczna 4<br>56-400 OLESNICA<br>POLAND |

according to the results of the internal production control and the third-party control carried out by the testing institute, recognized under building regulations,

**SKZ** - Testing GmbH
Friedrich-Bergius-Ring 22
97076 Würzburg
Germany

comply with the regulations of

the national technical approval no.: **Z-42.1-399** of **24 September 2021**
valid until: **3 October 2026**

Würzburg, 8 October 2021

SKZ-PÜZ-Stelle SKZ

i. V.

*Dipl.-Ing. Hans-Peter Krause*
*Head of Certification Body*

The original language of this certificate is German. In case of doubt, the German version is obligatory.

Fraunhofer
IBP

Institution for testing, supervision and certification, officially recognized by the building supervisory authority. Approvals of new building materials, components and types of construction

Director
Prof. Dr. Philip Leistner
Prof. Dr. Klaus Peter Sedlbauer

## Test Report P-BA 124/2020e

# Determination of the Acoustic Performance of a Wastewater Installation System in the Laboratory according to EN 14366

**Client:**

Nicoll Polska Sp. z o.o.
Ul. Energetyczna 6
56-400 Oleśnica
POLAND

Aliaxis Nederland B.V.
P.O. Box 7149
5980 AC Panningen
The Netherlands

Hereinafter refered to "Aliaxis Companies".

**Test object:** Wastewater installation system consisting of plastic pipes and fittings "dBlue DN 110 x 3.4, PP-ML: PP/PP-MD/PP, 10-03-2020" with pipe clamps with elastic inlay "dBlue Clamp" (manufacturer: Aliaxis Companies), mounted as supporting and fixing clamp.

**Content:**

| | |
|---|---|
| Results sheet 1: | Summary of test results |
| Figures 1 to 3: | Detailed results |
| Figures 4 and 5: | Test set-up |
| Annex A: | Measurement set-up, noise excitation, acoustic parameters, compliance with requirements |
| Annex F: | Evaluation of measurements |
| Annex P: | Description of the test facility |
| Annex V: | Assessment according to VDI 4100 |

**Test date:** The measurement was carried out on July 07, 2020 in the test facilities of the Fraunhofer Institute for Building Physics in Stuttgart.

Stuttgart, October 28, 2020

Responsible Test Engineer:

B.Sc. (FH) O. Born

Head of Laboratory:

M.BP. Dipl.-Ing.(FH) S. Öhler

The test was carried out in a laboratory, accredited according to DIN EN ISO/IEC 17025:2018 by DAkkS. The accreditation certificate is D-PL-11140-11-01.



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ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-11140-11-01

# Determination of the Acoustic Performance of a Wastewater Installation System in the Laboratory according to EN 14366

**P-BA 124/2020e**

**Results sheet 1**

**Client:** Aliaxis Companies

**Test specimen:** Wastewater installation system consisting of plastic pipes and fittings "dBlue DN 110 x 3.4, PP-ML: PP/PP-MD/PP, 10-03-2020" with pipe clamps with elastic inlay "dBlue Clamp" (manufacturer: Aliaxis Companies), mounted as supporting and fixing clamp. Test object no.: 11445-01; see figure 4 and 5.

**Test set-up:**

- The pipe system was mounted according to figure 4 (see also Annex A).
- The system consisted of wastewater pipes (nominal size OD 110), three inlet tees (88°), two 45°-basement bends with intermediate calming section (25 cm) and a horizontal drain section. The inlet tees in the basement and in the ground floor were closed by lids supplied by the manufacturer.
  - Pipe system "dBlue DN 110 x 3.4, PP-ML: PP/PP-MD/PP, 10-03-2020": Three-layer pipe with attached sleeve. Internal layer: PP copo; medial layer: PP MD, external layer: PP copo. Wall thickness 3.7 mm, weight 1.56 kg/m, density 1.33 g/cm³, values measured by IBP. One-layer fittings: PP MD, wall thickness 3.6 mm, density 1.15 g/cm³, values measured by IBP. Connection of the pipes by plug-on socket connection. Information supplied by the client.
  - Pipe clamps "dBlue Clamp" (figure 5): Steel pipe clamp with elastomeric insert and with one-sided closure, mounted as supporting and fixing clamp. In every storey (EG and UG) two pipe clamps were mounted: In the upper wall area a single guidance clamp with 3 spacers (3 x 6 mm) on one side of the clamp. In the lower wall area a double clamp consisting of a supporting/guidance clamp with 3 spacers (3 x 6 mm) on one side of the clamp and above a fixing clamp without spacers closed with 3 Nm (completely closed). The supporting and guidance clamps were fixed to the installation wall with dowels and thread rods. The fixing clamp had no contact to the wall (figure 5).

The wastewater installation system was mounted by a technician under the authority of Fraunhofer IBP.

**Test facility:** Installation test facility P12, mass per unit area of the installation wall: 220 kg/m², mass per unit area of the ceiling: 440 kg/m². Installation rooms: sub-basement (KG), basement (UG) front, ground floor (EG) front and top floor (DG), measuring rooms: UG front, UG rear (details in Annex P and DIN EN 14366: 2020-02)

**Test method:** The measurements were performed according to DIN EN 14366:2020-02; noise excitation by steady water flow with 0.5 l/s, 1.0 l/s, 2.0 l/s and 4.0 l/s. Additional evaluation for comparison with requirements following German standards DIN 4109-1:2018-01 and VDI 4100:2012-10 (details in Annexes A, F and V).

**Result:**

| Test specimen: Wastewater installation system consisting of plastic pipes and fittings "dBlue DN 110 x 3.4, PP-ML: PP/PP-MD/PP, 10-03-2020" with pipe clamps with elastic inlay "dBlue Clamp" (manufacturer: Aliaxis Companies), mounted as supporting and fixing clamp. | | Flow rate [l/s] 0.5 | 1.0 | 2.0 | 4.0 |
|---|---|---|---|---|---|
| Airborne sound pressure level $L_{a,A}$ [dB(A)] **according to EN 14366** for the basement test-room | UG front | 47 | 50 | 52 | 53 |
| Structure-borne sound characteristic level $L_{sc,A}$ [dB(A)] **according to EN 14366** for the basement test-room | UG rear | <10 | 13 | 13 | 16 |
| Installation sound level $L_{AFeq,n}$ [dB(A)] **following DIN 4109** in the basement test-room | UG front | 47 | 50 | 52 | 53 |
| | UG rear | 13 | 16 | 17 | 20 |
| Installation sound level $\overline{L_{AFeq,nT}}$ [dB(A)] **following VDI 4100** in the basement test-room | UG front | 45 | 47 | 50 | 50 |
| | UG rear | <10 | 13 | 13 | 16 |

**Test date:** July 07, 2020

**Notes:**

- For comparing test results with requirements note Annex A.
- Sound levels below 10 dB(A) are not mentioned in the official test report, since they are subject to an increased measurement uncertainty and moreover are not noticeable in a normal living environment.
- The above-mentioned measurement results require careful assembly of the pipe clamps (see test set-up).



Fraunhofer IBP

The test was carried out in a laboratory, accredited according to DIN EN ISO/IEC 17025:2018 by DAkkS. The accreditation certificate is D-PL-11140-11-01.

Stuttgart, July 22, 2020
Head of Laboratory