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# Environmental Product Declaration
# SANECOR® Corrugated PVC System

EN ISO 14025:2010
EN 15804:2012+A2:2019

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**Molecor Tecnología S.L.**

AENOR

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The holder of this Declaration is responsible for its content, as well as for conserving the supporting documentation that justifies the data and statements included during the period of validity.

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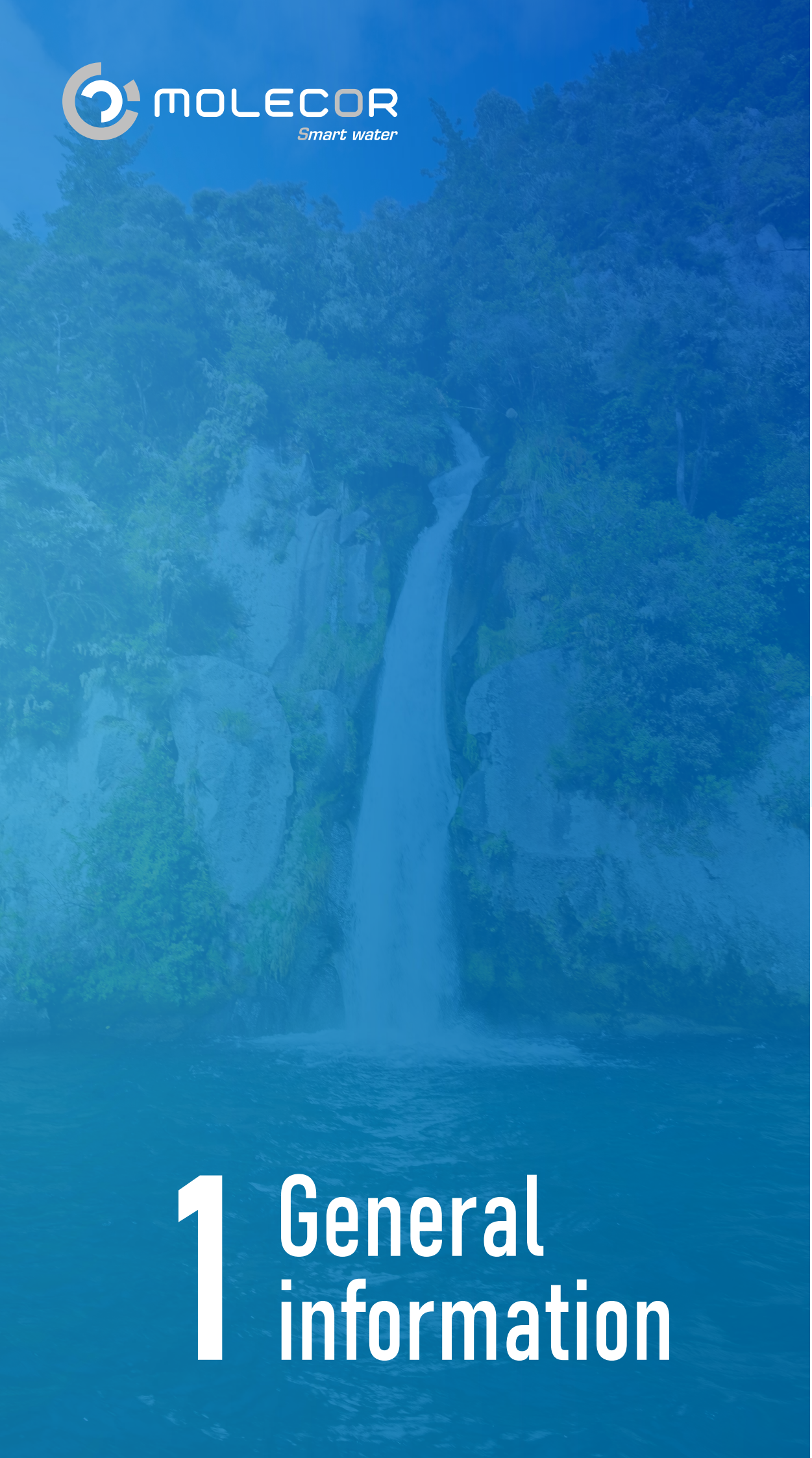
Independent verification of the declaration and data in accordance with the EN ISO 14025:2010 Standard

( ) Internal (X) External

Verification body

AENOR

The Certification Body is accredited by ENAC 1/C-PR468



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# Environmental Product Declaration

## SANECOR® Corrugated PVC System



# 1 General information

# 1. General information

### 1.1. The organisation

Molecor is a company that specialises in the channelling and use of the entire water cycle, offering innovative and high quality systems for drainage in buildings, drinking water supply, distribution of regenerated water, urban drainage and sewage networks, as well as irrigation pipes.

Molecor Tecnología is a Spanish company that specialises in the manufacture of molecularly oriented PVC pipes and fittings, and in the creation of molecular orientation technology applied to pressurised water pipes.

Founded in 2006 by qualified specialists with proven experience in this field, it has grown exponentially and provided efficient, innovative solutions to develop technology in molecularly oriented PVC pipe and fitting manufacturing, becoming the sector's world leader. Its staff members are extremely well-qualified and are the company's biggest asset, as well as the foundations for its continuous innovation.

In August 2020, the Spanish Private Equity firm MCH acquired a majority stake to give Molecor more strength to grow and develop its full potential, given that in addition to the monetary contribution, it also offers its industrial and financial expertise in both the organic and inorganic growth of the project.

In September 2021, the acquisition of Adequa's production unit (formerly Uralita Sistemas de Tuberías) was completed.

Since then, Molecor Group has become a larger, more diverse and above all more growth-oriented company with a broader product portfolio that now includes sewage and building products.

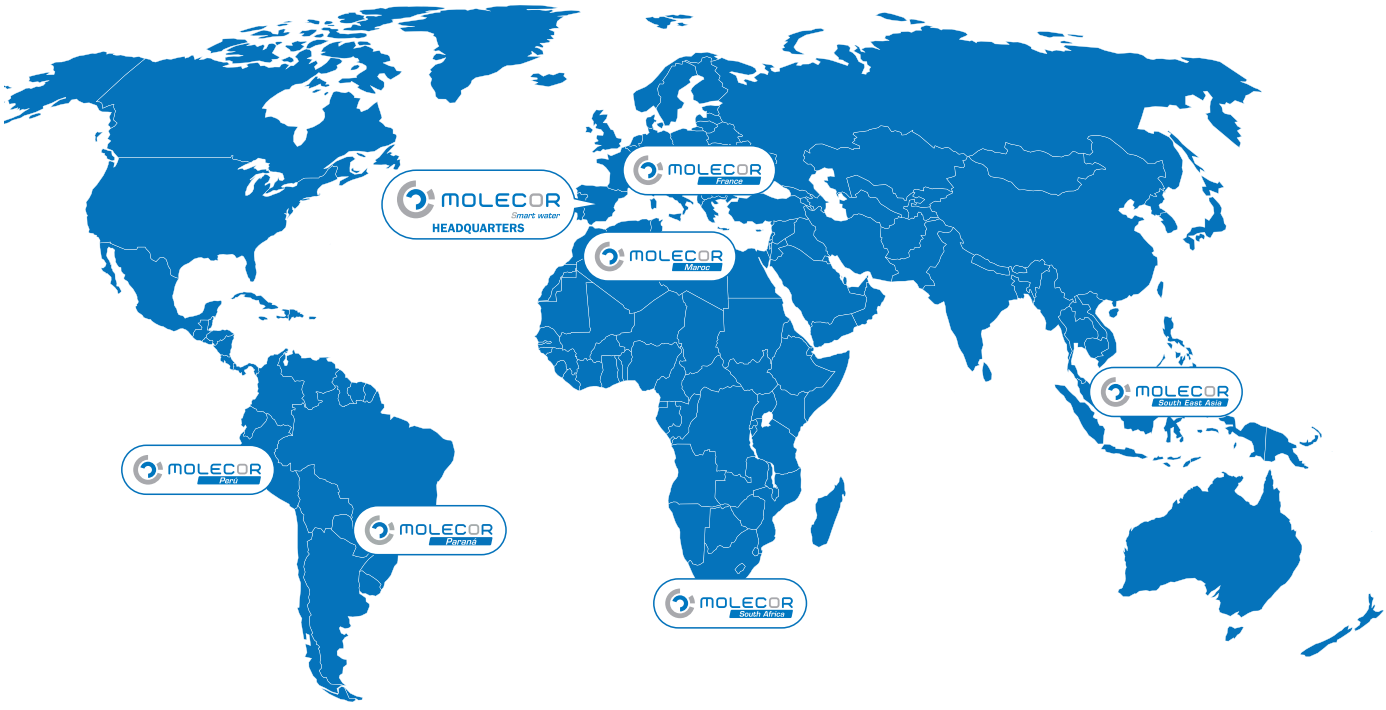
# 1. General information

**Molecor Group**

Molecor's main production centre is the Loeches plant in Madrid, where PVC-O products are manufactured: TOM® pipes that are produced in all the diameters included in the company's product portfolio, from DN90 to DN1200 mm in pressures from 12.5 to 25 bar and ecoFITTOM® PVC-O fittings, from DN110 to DN400 mm in PN16 bar. These products are manufactured using technology developed exclusively by the company and exported to the five continents. Thousands of kilometres of PVC-O TOM® pipes have already been installed throughout the world in supply, irrigation, recycling and fire prevention networks, and more.

The Getafe plant carries out the manufacturing of Oriented PVC technology and is the R&D headquarters. The rest of the production centres in Spain manufacture solutions for building, sewage, drainage, supply and distribution: SANECOR®, AR®, EVAC+®, etc.

In addition, there are also production centres outside of Spain. In Richards Bay (South Africa) a Joint Venture (JV) has been in operation since 2016 with Sizabantu Piping System, Molecor's partner and leading distributor in the South African market, the plant in Kuantan (Malaysia), started operations in 2014, and finally the Latin American factory based in Asunción (Paraguay), which started production in 2017. Molecor also has three marketers: Molecor Maroc, Molecor Perú and Molecor France.



# 1. General information

Molecor's products offer multiple solutions:

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TOM ecoFITTOM TR6 SANECOR AR EVAC+ adequa

- **For buildings:** EVAC+ and AR® PVC drainage pipes and fittings, floor drainage (manholes, gutters and drains), gutter systems and siphons.
- **For sewage and drainage:** SANECOR® corrugated PVC sewage, SANECOR® manholes, PVC COMPACT SN4® drainage system.
- **For supply and distribution:** TOM® Oriented PVC pipes, ecoFITTOM® Oriented PVC fittings, TR6® irrigation pipes, smooth PVC pressure pipes and fittings, fittings for smooth PE pipes.

Molecor's product strategy has always been focused on the development of high quality, cost-competitive solutions with the aim of adapting to the needs of the sectors in which it operates.

Thinking about the future of water means securing this resource in a sustainable and affordable way for the future. At Molecor we know that facing today's challenges means tackling essential issues such as climate change, energy transition, sustainability and the transformation of the customer experience with an open and innovative attitude, identifying opportunities, new business models and developing solutions that contribute to the development and well-being of society.

# 1. General information

**Our aim: To improve people's quality of life, wherever they are in the world, by providing them with accessible water using innovative, efficient, sustainable solutions.**

**Our values:**

**Refusing to conform:** We strive to exceed previously reached levels (quality, efficiency, innovation, safety, etc.) and we're never fully satisfied with what we achieve.

**Global:** We're a global company capable of offering services and products to anywhere in the world. We do this by creating an open, diverse and inclusive environment in which any talent can thrive, regardless of nationality, location or origin.

**Honesty:** We apply integrity in our relationships and decisions to all levels within a tolerant and respectful environment. We do this transparently, while always respecting the law, regulatory limits and the principles of confidentiality and privacy.

**Commitment:** We're committed to, strive for and value commitment to the people in the area around us, the environment and the communities where we are present and where we provide our services.

**Attitude:** We love challenges and we're ready to actively tackle them, always doing our best and offering maximum collaboration and flexibility in an open, sincere way.

Molecor's business model has three fundamental pillars, which have allowed it to achieve growth rates well above those of the sector, as well as an excellent international presence.

**Innovation** **Internationalisation** **Flexibility**

To contribute to this "climate call to action", a drive for energy efficiency, emission reduction and natural resource savings is needed, which has been intrinsic to our company since it was founded in 2006. However, we know there is great social opposition to the industry and we're working to mitigate that with evidence, scientific studies and industry work groups. It's important to note that Molecor's activity directly contributes to a fair, ecological transition supported by data.

With regard to the 2030 Agenda, Molecor is fully committed to the Sustainable Development Goals (SDGs). The company identified the pertinent SDGs in order to focus our efforts and pinpoint opportunities for improvement, as well as potential risks. In this vein, we're particularly involved with SDG 6, clean water and sanitation, as our products allow communities to gain simple access to drinking water, as well as drain wastewater that could harm health.

# 1. General information

**Sustainability**

For Molecor, being a responsible company means transforming its business model to achieve an ideal balance between creating economic value and having a positive impact on the planet and people's lives. To this end, in addition to the initiatives carried out since its creation in socio-environmental and governance matters, it has defined an ESG Strategic Plan until 2025 in which the actions to be carried out to achieve an increasingly sustainable business model have been established.

Molecor is fully committed to innovation and the development of new, more sustainable products, taking into account eco-design in their conception and promoting the principles of the Circular Economy and the sustainable use of resources.

With regard to the environment, Molecor is working on:

- Energy management, improving the energy efficiency of production processes with the implementation of a management system based on the ISO 50001 standard, implementing all the energy saving measures detected. The use of renewable energies has also increased, through the installation of solar power plants for self-supply.
- Creation of innovative products, increasing their performance and durability, with a sustainable use of resources, and reducing their carbon footprint.
- Waste management, reusing all surplus production in the manufacture of new pipes and fittings.
- Commitment and certification to the voluntary Operation Clean Sweep (OCS) programme, which aims to prevent the unintentional loss of primary microplastics to the environment.
- Emission reductions, with the aim being Net Zero by 2040.

From a social perspective, Molecor works both internally and externally. Internally, it works to create health and well-being for its employees, ensuring their safety through the Prevention management system. With external stakeholders, both national and international social actions are promoted in different areas such as the promotion of grassroots sport, social integration or community development, creating alliances with different stakeholders.

Molecor does this by applying good governance practices through management policies and a compliance model, which allows the company to establish a business model that creates shared value and contributes to generating a positive impact on people's lives and the environment.

# 1. General information

### 1.2. Scope of the Declaration

The scope of this LCA is the cradle-to-grave manufacture of the SANECOR® sewage system for use in the construction sector:

- SANECOR® pipes
- Manholes
- Fittings

The specific data on the production process of the products included in this LCA study come from Molecor's facilities in Alcázar de San Juan and correspond to production data for the year 2022, which is considered representative.

### 1.3. Life cycle and compliance

This EPD has been developed and verified in accordance with UNE-EN ISO 14025:2010 and UNE-EN 15804:2012+A2:2020.

| INFORMATION ON PRODUCT CATEGORY RULES | |
|---|---|
| **Descriptive title** | Sustainability in construction. Environmental product declarations. Basic product category rules for construction products. |
| **Registration code and version** | UNE-EN 15804:2012 + A2:2020 |
| **Issue date** | 2020-03 |
| **Compliance** | UNE-EN 15804:2012 + A2:2020 |

This EPD includes the life cycle stages listed in table 1-1. This EPD is of the cradle-to-grave type.

# 1. General information

This EPD might not be comparable with those developed in other programmes or under different reference documents, and especially with EPDs not developed under the same Product Category Rules.

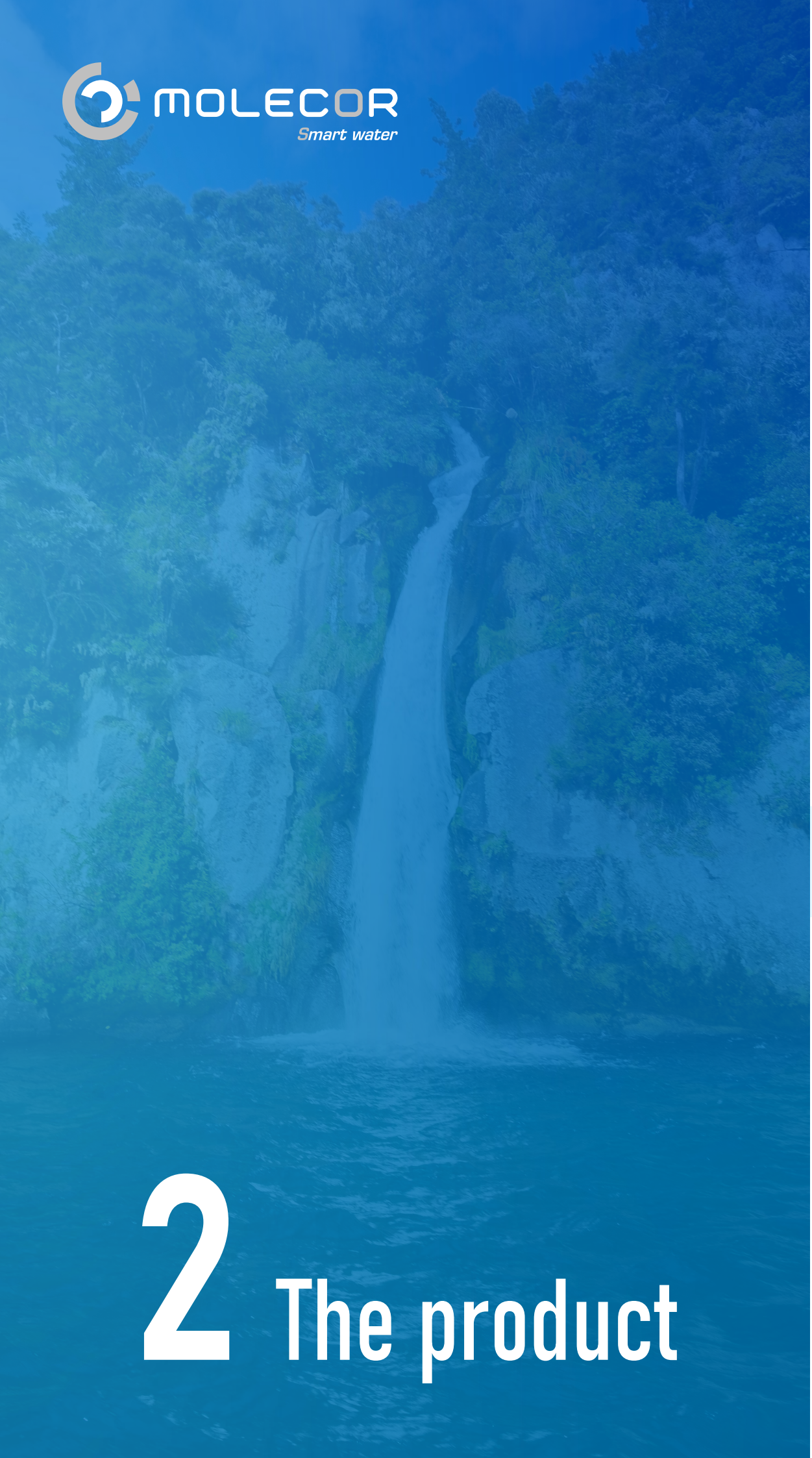
Similarly, EPDs might not be comparable if the source of the data is different (e.g. databases), not all relevant information modules are included, or if they are not based on the same scenarios.

The comparison of construction products must be made on the same function, applying the same functional unit and at the level of the building (or architectural or engineering work), i.e. including the behaviour of the product throughout its life cycle, as well as the specifications of section 6.7.2 of UNE-EN ISO 14025 Standard.

**Table 1-1. System limits. Information modules considered**

| | | | |
|---|---|---|---|
| **Product stage** | A1 | Supply of raw materials | X |
| | A2 | Transportation to the factory | X |
| | A3 | Manufacture | X |
| **Construction** | A4 | Transportation to the construction site | X |
| | A5 | Installation / Construction | X |
| **Use stage** | B1 | Use | MNE |
| | B2 | Maintenance | MNE |
| | B3 | Repair | MNE |
| | B4 | Replacement | MNE |
| | B5 | Reconditioning | MNE |
| | B6 | In-service energy use | MNE |
| | B7 | In-service water use | MNE |
| **End of life** | C1 | Deconstruction / Demolition | X |
| | C2 | Transportation | X |
| | C3 | Waste treatment | X |
| | C4 | Disposal | X |
| | D | Potential for reuse, recovery and/or recycling | X |

X = Module included in the LCA; MNR = Module not relevant; MNE = Module not evaluated



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# Environmental Product Declaration

## SANECOR® Corrugated PVC System



# 2 The product

# 2. The product

## 2.1. Product identification

This EPD includes the manufacture of the SANECOR® sewage system consisting of SANECOR® double wall corrugated PVC SN8 pipes, manholes and SANECOR® pipe fittings.

CPC Code: 3632 - Tubes, pipes, hoses and fittings made of plastic.

The SANECOR® corrugated PVC sewage system is used in urban sewage networks, wastewater and rainwater collectors, interceptor sewers, outfalls, drains and, in general, pipelines that transport acid or alkaline solutions, applications in industry, construction, mining, cable conduction and insulation, etc.

## 2.2. Product description

The SANECOR® corrugated PVC system is the result of a very demanding design and an extensive study and development of high technology aimed at obtaining a pipe that fully satisfies the needs of a sewerage network.

SANECOR® pipes and fittings are used in urban sewerage networks, interceptor sewers, outfalls, drains and, in general, pipelines for transporting water and other liquids by gravity (industrial pipelines, replacement of irrigation ditches, etc.).

In urban sewer networks, and in general in pipes of a certain diameter or larger that carry water by gravity, it is necessary to have a series of manholes separated from each other at distances not usually greater than 50 m. The purpose of this is to ensure access to the pipeline in order to carry out inspection, maintenance or repair work, among others.

With the SANECOR® corrugated PVC system, a wide range of manholes can be made to measure for multiple uses: sampling, grease separators, siphon manholes, etc., taking advantage of the benefits of plastic materials and ensuring that the network remains watertight.

The SANECOR® sewage system is available in the following dimensions:

| Nominal Diameter (DN) | Pipe Internal Diameter (DI) | Pipe External Diameter (DE) | Cup Maximum External Diameter | Average Opening Length |
|---|---|---|---|---|
| 160 | 146 | 160 | 182 | 105 |
| 200 | 182 | 200 | 228 | 122 |
| 250 | 228 | 250 | 284 | 165 |
| 315 | 285 | 315 | 358 | 190 |
| 400 | 364 | 400 | 448 | 199 |
| 500 | 452 | 500 | 563 | 230 |
| 630 | 590 | 649 | 734 | 252 |
| 800 | 775 | 856 | 954 | 330 |
| 1,000 | 970 | 1,072 | 1,222 | 495 |
| 1,200 | 1,103 | 1,220 | 1,379 | 547 |

# 2. The product

Its main advantages are:

- Completely watertight system, prevents leaks from the network to the environment and infiltrations from the phreatic to the sewage network.
- High stiffness, presenting very high values of resistance to loads, both in the short and long term.
- High hydraulic capacity with large internal diameters guaranteeing optimum flow rates.
- High durability due to high chemical resistance and absence of corrosion.
- High assembly performance due to the easy connection of the pipes and the fact that in the manholes, the connection of the pipes is carried out on site by means of elastomeric clips.
- Wide range of pipe, fittings and manhole products.
- Extensive experience in use (30 years) and in the installation of more than 55,000 km of piping.
- 100% recyclable.

SANECOR® pipes are certified by AENOR in accordance with the requirements of the UNE-EN 13476 standard. The fittings are manufactured in accordance with the UNE-EN 13473 standard.

### 2.3. Product characteristics

| PHYSICAL AND CHEMICAL CHARACTERISTICS | |
|---|---|
| Density | 350 to 1520 kg/m$^3$ |
| Coefficient of linear expansion | 8 x 10$^{-5}$ m/m. ºC |
| Thermal conductivity | 0.13 kcal/m.h. ºC |
| Specific heat | 0.2 a 0.3 cal/g. ºC |
| Vicat softening temperature | ≥ 79 ºC, in accordance with UNE-EN ISO 2507-1 standard |
| pH limits | Between 3 and 9, at 20 ºC |
| Dichloromethane resistance | At 15ºC, for 30 minutes, in accordance with UNE-EN ISO 9852 |
| Oven test | In accordance with ISO 12091 standard |

| MECHANICAL CHARACTERISTICS | |
|---|---|
| Ring stiffness (also known as SCS = specific circumferential stiffness) | SCS ≥ 8kN/m$^2$, in accordance with UNE-EN ISO 9969 |
| Creep coefficient at 2 years | ≤ 2.5, in accordance with UNE-EN ISO 9967 (real value between 1.6 and 1.8) |
| Impact resistance | In accordance with UNE-EN ISO 3127 (round-the-clock method) |
| Ring flexibility | 30% deformation in DN160 to DN315, and 20% in DN400 to DN1200, in accordance with UNE-EN ISO 13968 |

| HYDRAULIC CHARACTERISTICS | |
|---|---|
| Water tightness with elastomeric seal under internal pressure | SCS ≥ 8kN/m$^2$, in accordance with UNE-EN ISO 9969 |
| Water tightness with elastomeric seal under internal depression | ≤ 2.5, in accordance with UNE-EN ISO 9967 (real value between 1.6 and 1.8) |
| Equivalent rugosity (Prandtl-Colebrook) | K= 0.01 mm (for clean water)<br>K= 0.10 to 0.25 mm (for waste water) |

# 2. The product

## 2.4. Product composition

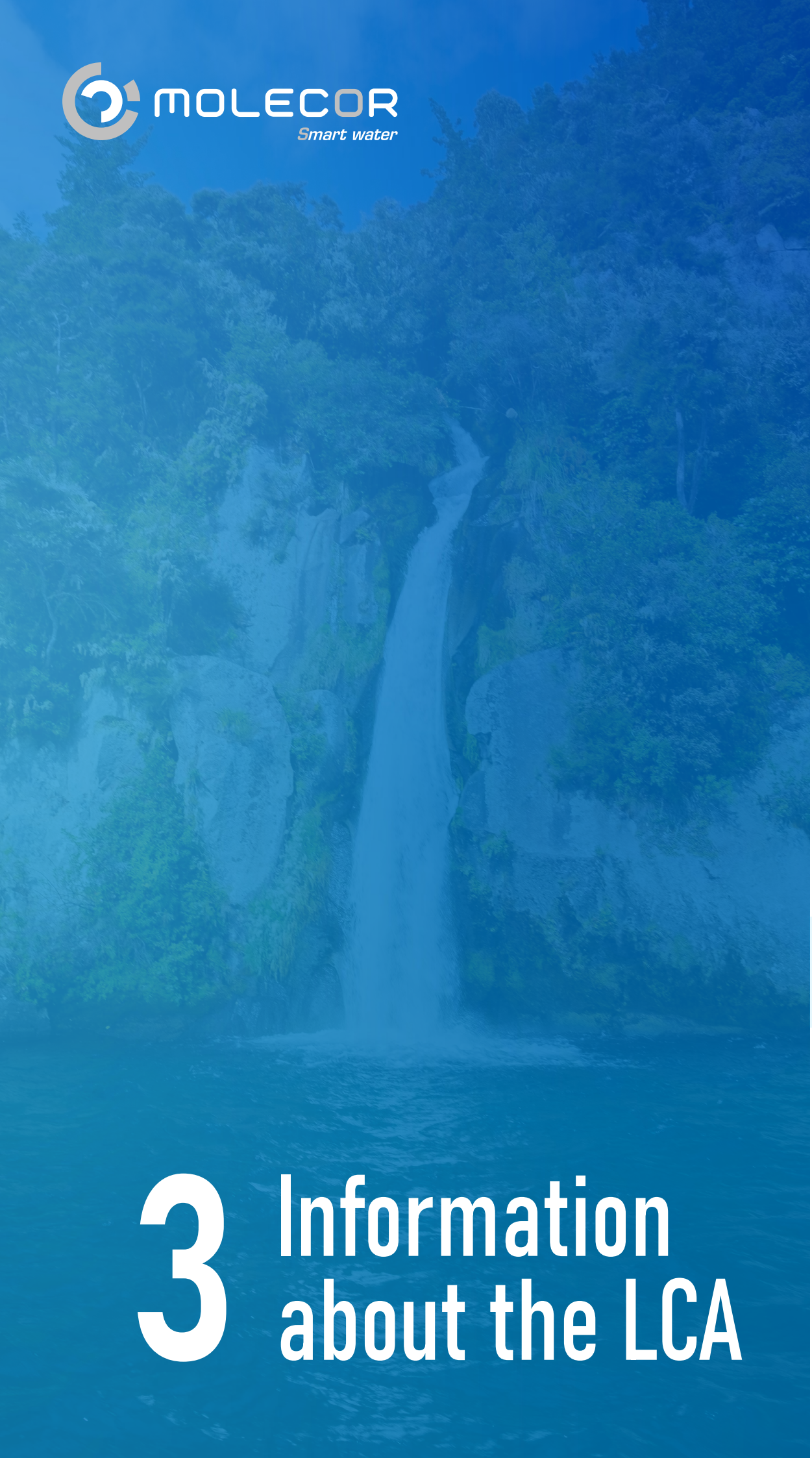
The composition declared by the manufacturer is as follows:

| SANECOR® Sewage System | |
|---|---|
| **Material** | **Total % by weight** |
| PVC (pipes and manholes) | 98.12% |
| Other (fittings, seals, etc.): | |
| · EPDM | 1.21% |
| · PE | 0.66% |
| · Auxiliary materials | 0.01% |

The distribution packaging used for the dispatch of the SANECOR® sewage system, per declared unit, is:

| Material | Kg packaging/unit declared |
|---|---|
| Plastic | 3.03E-03 |
| Wood | 3.35E-02 |
| Steel | 1.76E-03 |

The manufacturer declares that no hazardous substances listed in the "Candidate List of Substances of Very High Concern (SVHC) authorization" are used during the life cycle of the product in a percentage greater than 0.1% of the weight of the product.



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# Environmental Product Declaration

## SANECOR® Corrugated PVC System



# 3 Information about the LCA

# 3. Information about the LCA

### 3.1. Life cycle analysis

The Life cycle analysis report for the EPD of Molecor's SANECOR® sewage system was carried out by the company Abaleo S.L. using the Ecoinvent 3.9.1 database and the SimaPro 9.5.0.0 software, which is the most up-to-date version available at the time the LCA was carried out.

Data from the Molecor plant, located in Alcázar de San Juan, Ciudad Real (Spain), were used for the study.

The LCA study follows the recommendations and requirements of the international standards ISO 14040:2006, ISO 14044:2006 and the European standard UNE-EN 15804:2012+A2:2020 as reference rules for the product category.

### 3.2. Scope of the system

The scope of this LCA is the cradle-to-grave manufacture of the SANECOR® sewage system for use in the construction sector:

- SANECOR® pipes
- Manholes
- Fittings

The following phases of the product life cycle have been studied:

**Product stage**

- A1, production of the raw materials that form part of the final product and generation of the energy for the production process.
- A2, transportation of raw materials to Molecor's facilities.
- A3, production of pipes and manholes and fittings at the Alcázar de San Juan plant, including energy consumption; production of auxiliary materials and their transport to the factory; and transport and management of waste generated.

**Construction stage**

- A4, transportation from Molecor's factory to the customer.
- A5, installation of the SANECOR® sewage system.

**Use stage**

B1 - B7, use stage: not applicable; under normal conditions of use, the SANECOR® sewage system does not require the use of materials, water or energy during its lifetime.

# 3. Information about the LCA

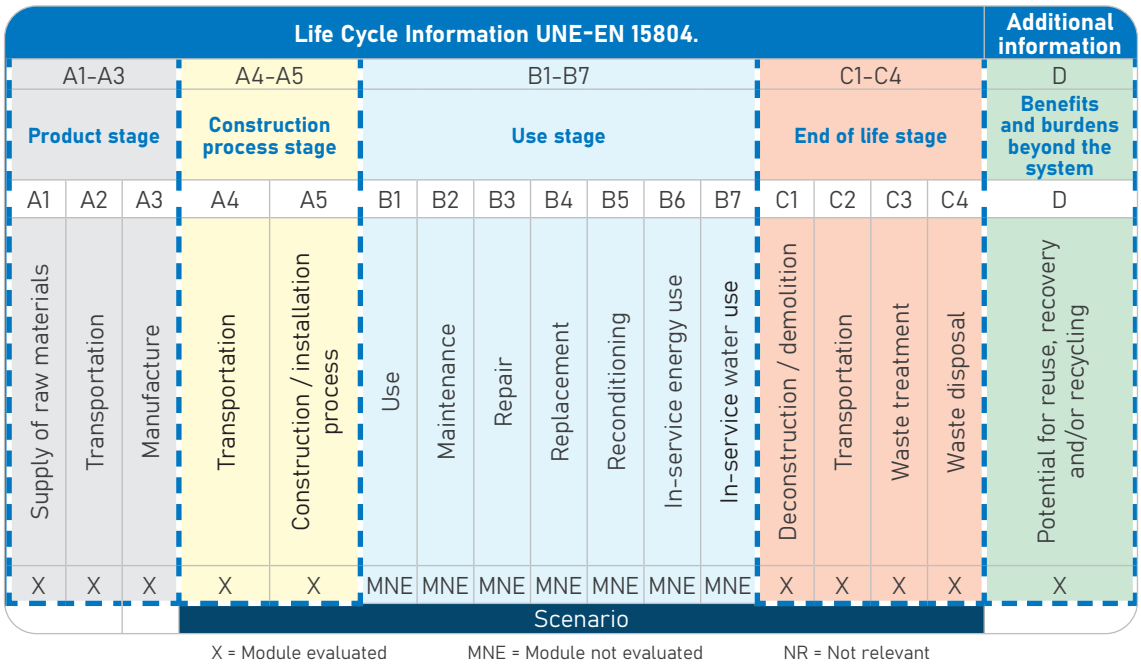
### End of life stage

- C1, deconstruction or demolition.
- C2, transportation of the dismantled materials to the waste treatment or disposal site.
- C3, treatment of waste for reuse, recovery and/or recycling.
- C4, waste disposal, including physical pre-treatment and management at the disposal site and associated energy and water use.

### Benefits and burdens beyond the system

D, reuse, recovery and/or recycling potential, expressed as net benefits and burdens.

**Figure 1. Stages and information modules for building assessment. Life cycle of the building**




### 3.3. Declared unit

The declared unit is 1 kg of product, including distribution packaging.

### 3.4. Reference service life (RSL)

The Reference Service Life (RSL) of the SANECOR® sewage system is 50 years.

# 3. Information about the LCA

### 3.5. Allocation criteria

According to the criteria of the reference standard:

1. Where possible, the product system has been extended to avoid the allocation of environmental impacts of multi-output unit processes.
2. Where it has not been possible to avoid allocation, an allocation of the inputs and outputs of the system has been made on a mass basis. This allocation criterion has been applied for electricity, oil, gas and packaging consumption, as well as for waste.

It has not been necessary to apply other allocation criteria, such as financial allocation.

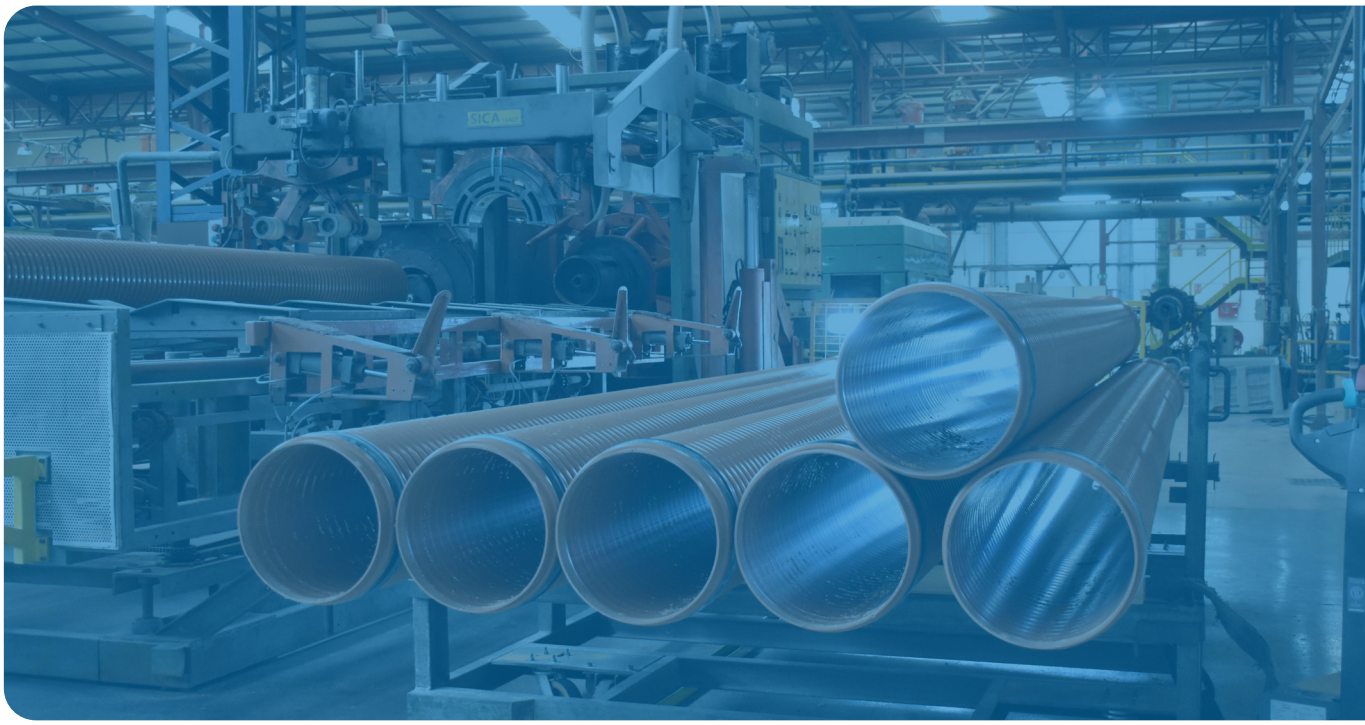
### 3.6. Cutting rule

The gross weight/volume of all materials used in the manufacturing process has been included in the LCA. Consequently, the criterion of including at least 99% of the total weight of the products used for the declared functional unit is fulfilled.

### 3.7. Limitations of the study

The following have not been included in the LCA:

- All equipment with a useful life of more than 3 years.
- The construction of plant buildings and other capital goods.
- The staff's commute to and from work.



# 3. Information about the LCA

### 3.8. Representativeness, quality and selection of data

To model the manufacturing process of Molecor's SANECOR® sewage system, production data for the year 2022, which is a period with representative production data, has been used for the plant located in Alcázar de San Juan (Ciudad Real, Spain). The following data was obtained from this factory: consumption of materials and energy; transport; and waste generation.

Where necessary, the Ecoinvent 3.9.1 database (January 2023), which is the latest version available at the time of the LCA, has been used. For the inventory data, for modelling the LCA and for calculating the environmental impact categories required by the reference standard, SimaPro 9.5.0.0 software was used, which is the most up-to-date version available at the time of the study.

The following criteria were used to select the most representative processes:

- Data that are representative of the technological development actually applied in the manufacturing processes. In the event that no information was available, a data representative of an average technology has been chosen.
- Geographic data should be as close as possible and, where appropriate, using regionalised means.
- Data should be as up to date as possible.

In order to assess the quality of the primary production data of Molecor's SANECOR® sewage system, the semi-quantitative data quality assessment criteria proposed by the European Union in its Guide to the Environmental Footprint of Products and Organisations are applied. The results are as follows:

- Very good integrity. Score 1.
- Reasonable methodological appropriateness and coherence. Score 2.
- Very good time representation. Score 1.
- Good technological representation. Score 2.
- Very good geographical representation. Score 1.
- Low data uncertainty. Score 2.

Based on the above data, the Data Quality Rating (DQR) has the following value: 9/6= 1.5, which indicates that the quality of the data is excellent.

For a better understanding of the data quality assessment carried out, it is indicated that the score for each of the criteria varies from 1 to 5 (the lower the score, the higher the quality) and that the following table is applied to obtain the final score.

| Overall data quality score (DQR) | Overall quality level of data |
|---|---|
| ≤ 1.6 | Excellent quality |
| 1.6 to 2.0 | Very good quality |
| 2.0 to 3.0 | Good quality |
| 3 to 4.0 | Average quality |
| > 4 | Poor quality |

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SANECOR® Corrugated PVC System

# 4 System limits, scenarios and additional technical information

# 4. System limits, scenarios and additional technical information

### 4.1. Module A1 - Raw material production

This module considers the procurement of raw materials and the production of the electrical energy used in the production process.

### 4.2. Module A2 - Transportation

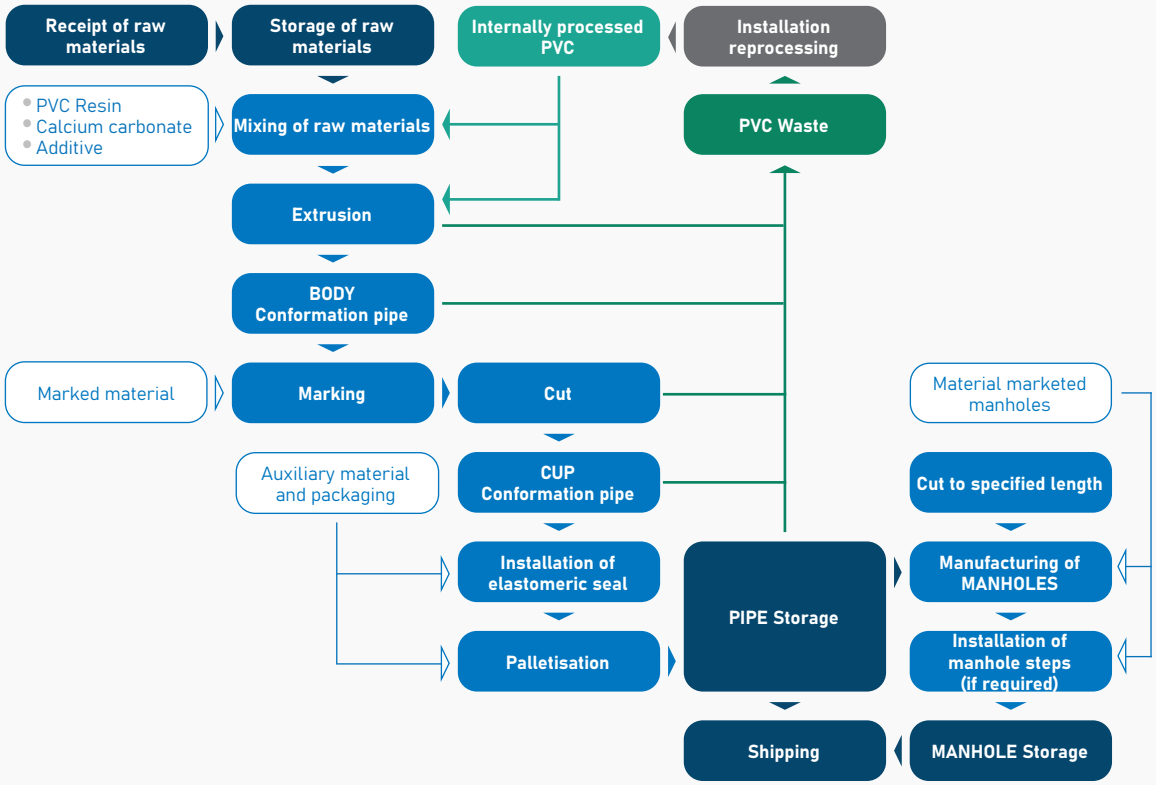
The transportation of all raw materials from the production sites (suppliers) to Molecor's facilities has been considered, distinguishing in each case the mode of transport used: lorry and ship.

### 4.3. Module A3 - Manufacture

This module includes the following:

- The manufacturing process of SANECOR® pipes and manholes.
- The production of auxiliary materials and their transportation to Molecor.
- The manufacture of the packaging and its transportation from the suppliers to Molecor's plant.
- The treatment of the waste generated and its transportation from the plant to the waste manager.

## SANECOR® process diagram



# 4. System limits, scenarios and additional technical information

### 4.4. Module A4 – Delivery to customer

The delivery of the products studied has been considered, from the production sites to the facilities where they are used, distinguishing the mode of transport used: ship or lorry.

| Module A4 | |
|---|---|
| **Parameter** | **Quantity (per unit declared)** |
| Litres of fuel:<br>- Diesel in EURO 6 lorry (29.96 t payload)<br>- Heavy diesel in transoceanic ship (43,000 dwt) | <br>0.0436 l/tkm<br>0.0026 l/tkm |
| Average distance:<br>- Lorry<br>- Ship | <br>378.34 km<br>2,557.81 km |
| Capacity utilisation (including empty return) | 50% * |
| Bulk density of transported products | The variability of product formats does not allow for the identification of a single bulk density. |
| Useful capacity factor | The variability of product formats does not allow for the identification of a useful capacity factor. |

* Percentage obtained from the Ecoinvent database

### 4.5. Module A5 – Product installation

This module takes into account the material and energy consumption necessary for the correct installation of 1 kg of SANECOR® sewage system, considering a pipe diameter of 250 mm, as indicated in the draft document *Illustrative calculation of generic EPD scenarios for Sewer and Drainage [plastic] piping system (ref. 2023/SEB/R/2901)*, February 2023, based on TEPPFA (European Plastic Pipes and Fittings Association) criteria, as set out in Plastics Europe's Overview of Plastic Waste from Building and Construction by Polymer and by Recycling, Energy Recovery and Disposal, energy recovery and disposal (2019).

# 4. System limits, scenarios and additional technical information

The modelling of the installation scenario considering a pipe diameter of 250 mm is due to the sales for the year under study, in which 61.5% of the total product distributed to the customer is of a diameter of 250 mm or less.

As stated in the aforementioned document, the soil extracted at this stage is reused as filler in another product system and is therefore not considered as waste; and the incorporated soil is recovered from another similar operation and is therefore not considered as having been extracted. For these two aggregate concepts, transportation is considered, with an average distance of 35 km.

The wood used as distribution packaging for the product studied is not managed as waste, as it is recovered for subsequent use.

| Module A5 | |
|---|---|
| **Parameter** | **Quantity (per unit declared)** |
| Auxiliary materials for installation<br>- Soap (lubricant)<br>- Sand<br>- Gravel | <br>5.80E-07 tonnes<br>9.06E-02 tonnes<br>1.17E+00 tonnes |
| Water use | - |
| Energy consumed during the Diesel installation process in machinery | 0.0118 GJ |
| Waste of materials on site prior to waste treatment, generated by the installation of the product<br>- Plastic (packaging) for recycling.<br>- Steel (packaging) for recycling | <br>3.03E-03 kg<br>1.76E-03 kg |
| Output of materials as a result of waste treatment of waste on the building plot: aggregate | 1.21E+00 tonnes |
| Direct emissions to ambient air, soil and water | - |

## 4.6. Module C1 - Deconstruction/demolition

This LCA takes into account the energy consumption of the deconstruction (C1) and the extraction of 1 kg of Molecor's SANECOR® sewage system, considering a pipe diameter of 250 mm, as indicated in the draft document Illustrative calculation of generic EPD scenarios for Sewer and Drainage [plastic] piping system (ref. 2023/SEB/R/2901), February 2023, based on TEPPFA (European Plastic Pipes and Fittings Association) criteria, as set out in Plastics Europe's Overview of Plastic Waste from Building and Construction by Polymer and by Recycling, Energy Recovery and Disposal, energy recovery and disposal (2019).

The modelling of the demolition scenario considering a pipe diameter of 250 mm is due to the sales for the year under study, in which 61.5% of the total product distributed to the customer is of a diameter of 250 mm or less.

# 4. System limits, scenarios and additional technical information

## 4.7. Module C2 - Transportation to waste treatment/recovery site

Applying the TEPPFA criteria, as set out in Plastics Europe's Overview of Plastic Waste from Building and Construction by Polymer and by Recycling, Energy Recovery and Disposal, energy recovery and disposal (2019), waste from SANECOR® end-of-life pipes and manholes is transported over the following distances, using EURO6 lorries of 16-32 tonnes:

- 800 km for recycling.
- 150 km for incineration.
- 50 km to take to rubbish tips.

## 4.8. Module C3 - Waste treatment, and Module C4 - Waste disposal

The following TEPPFA criteria are applied for the modelling of waste treatment and disposal scenarios:

| PE – Plastics Europe 2018 | |
|---|---|
| Recycling percentage | 24.00% |
| Incineration percentage | 48.89% |
| Rubbish tip percentage | 27.11% |

| PVC – Plastics Europe 2018 | |
|---|---|
| Recycling percentage | 33.96% |
| Incineration percentage | 40.99% |
| Rubbish tip percentage | 25.05% |

| EPDM – Plastics Europe 2018 | |
|---|---|
| Recycling percentage | 7.66% |
| Incineration percentage | 65.53% |
| Rubbish tip percentage | 26.81% |

By applying the values indicated in the tables above to the composition of the SANECOR® sewage system, we can see the following end-of-life scenario results.

| Module C | | |
|---|---|---|
| **Parameter** | **Quantity (per unit declared)** | |
| Demolition energy consumption | 0.011 GJ | |
| Collection process, specified by type | 0 kg collected separately.<br>1000 kg collected with mixed construction waste. | |
| Recovery system, specified by type | 0 kg for reuse.<br>0.333 kg of PVC and 0.004 kg of PE for recycling. | |
| Disposal, specified by type | For final disposal at a rubbish tip:<br>- 0.411 kg of material | For incineration:<br>- 0.251 kg of material |
| Assumptions for scenario development (transport) | Transport of waste by EURO6 lorry of 16-32 tonnes:<br>- 800 km for recycling;<br>- 150 km for incineration;<br>- 50 km to take to rubbish tips. | |

## 4.9. Module D - Benefits beyond the system

The recovery coefficient has been applied to each waste that is sent for recycling as determined by TEPPFA, as set out in Plastics Europe's Overview of Plastic Waste from Building and Construction by Polymer and by Recycling, Energy Recovery and Disposal, energy recovery and disposal (2019):

- 90% of the 0.333 kg of PVC sent for recycling, excluding 5.46% by weight, corresponding to the amount of secondary material used in the product stage of SANECOR® sewage system manufacture.
- 90% of the 0.0045 kg of PE sent for recycling.

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Environmental Product Declaration

SANECOR® Corrugated PVC System

# 5 Declaration of the environmental parameters of the LCA and of the LCI

# 5. Declaration of the environmental parameters of the LCA and of the LCI

The different environmental parameters obtained from the Life Cycle Analysis (LCA) for the production of 1 kilogram of SANECOR® are shown below.

The estimated impact results are relative and do not indicate the final value of the impact categories, nor do they refer to threshold values, safety margins or risks.

## Environmental impacts

**SANECOR®**
Declared unit: 1 kilogram

| Parameter | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **GWP-total** | kg $CO_2$ eq | 1.69E+00 | 9.73E-02 | -2.39E-02 | 1.76E+00 | 3.12E-02 | 1.44E+01 | 1.03E+00 | 5.15E-02 | 7.95E-02 | 2.12E-01 | -4.05E-01 |
| **GWP-fossil** | kg $CO_2$ eq | 1.68E+00 | 9.73E-02 | 3.74E-02 | 1.82E+00 | 3.12E-02 | 1.43E+01 | 1.03E+00 | 5.14E-02 | 7.01E-02 | 2.12E-01 | -4.07E-01 |
| **GWP-biogenic** | kg $CO_2$ eq | 4.62E-03 | 6.25E-06 | -6.13E-02 | -5.67E-02 | 1.99E-06 | 6.25E-02 | 6.75E-05 | 3.36E-06 | 9.22E-03 | 8.80E-06 | 1.88E-03 |
| **GWP-luluc** | kg $CO_2$ eq | 2.73E-03 | 2.16E-06 | 5.76E-05 | 2.79E-03 | 6.68E-07 | 2.21E-03 | 4.20E-05 | 1.01E-06 | 1.44E-04 | 2.11E-06 | -2.46E-04 |
| **ODP** | kg CFC-11 eq | 8.94E-07 | 2.01E-09 | 4.24E-10 | 8.96E-07 | 6.79E-10 | 3.20E-07 | 1.62E-08 | 1.11E-09 | 1.36E-09 | 5.72E-10 | -2.64E-07 |
| **AP** | mol H+ eq | 6.06E-03 | 4.48E-04 | 6.05E-05 | 6.56E-03 | 1.20E-04 | 4.50E-02 | 9.83E-03 | 6.47E-05 | 3.02E-04 | 1.16E-04 | -1.35E-03 |
| **EP-freshwater** | kg P eq | 5.74E-05 | 7.63E-08 | 1.11E-06 | 5.86E-05 | 2.52E-08 | 3.21E-05 | 8.79E-07 | 4.04E-08 | 5.95E-06 | 1.42E-07 | -1.35E-05 |
| **EP-marine** | kg N eq | 1.17E-03 | 1.25E-04 | 1.87E-05 | 1.32E-03 | 2.99E-05 | 1.84E-02 | 4.62E-03 | 1.60E-05 | 5.56E-05 | 5.43E-05 | -2.62E-04 |
| **EP-terrestrial** | mol N eq | 1.21E-02 | 1.34E-03 | 1.74E-04 | 1.36E-02 | 3.18E-04 | 1.96E-01 | 5.02E-02 | 1.56E-04 | 4.92E-04 | 5.58E-04 | -2.67E-03 |
| **POCP** | kg NMVOC eq | 5.11E-03 | 4.92E-04 | 7.82E-05 | 5.68E-03 | 1.30E-04 | 7.14E-02 | 1.48E-02 | 1.21E-04 | 1.63E-04 | 1.42E-04 | -1.20E-03 |
| **ADP-minerals & metals** [2] | kg Sb eq | 1.92E-06 | 3.20E-09 | 2.54E-09 | 1.93E-06 | 1.05E-09 | 5.45E-07 | 4.33E-08 | 1.78E-09 | 3.05E-08 | 3.04E-09 | -4.83E-08 |
| **ADP-fossil** [2] | MJ, v.c.n. | 4.07E+01 | 1.28E+00 | 2.85E-01 | 4.22E+01 | 4.24E-01 | 1.90E+02 | 1.35E+01 | 6.80E-01 | 7.45E-01 | 9.72E-02 | -1.06E+01 |
| **WDP** [2] | $m^3$ eq | 3.94E+00 | 1.19E-03 | 1.47E-02 | 3.96E+00 | 3.85E-04 | 2.59E-01 | 1.73E-02 | 6.21E-04 | 1.54E-02 | 3.25E-02 | -8.01E-01 |

**GWP - total:** Global warming potential;
**GWP - fossil:** Global warming potential of fossil fuels;
**GWP - biogenic:** Biogenic global warming potential;
**GWP - luluc:** Global warming potential of land use and land use change;
**ODP:** Stratospheric ozone depletion potential;
**AP:** Acidification potential, cumulative surplus;
**EP-freshwater:** Eutrophication potential, fraction of nutrients reaching the final freshwater compartment;
**EP-marine:** Eutrophication potential, fraction of nutrients reaching the final marine water compartment;
**EP-terrestrial:** Eutrophication potential, cumulative surplus;
**POCP:** Tropospheric ozone formation potential;
**ADP-minerals & metals:** Abiotic resource depletion potential for non-fossil resources;
**APD-fossil:** Abiotic resource depletion potential for fossil resources;
**WDP:** Water deprivation potential (user), weighted water deprivation consumption.

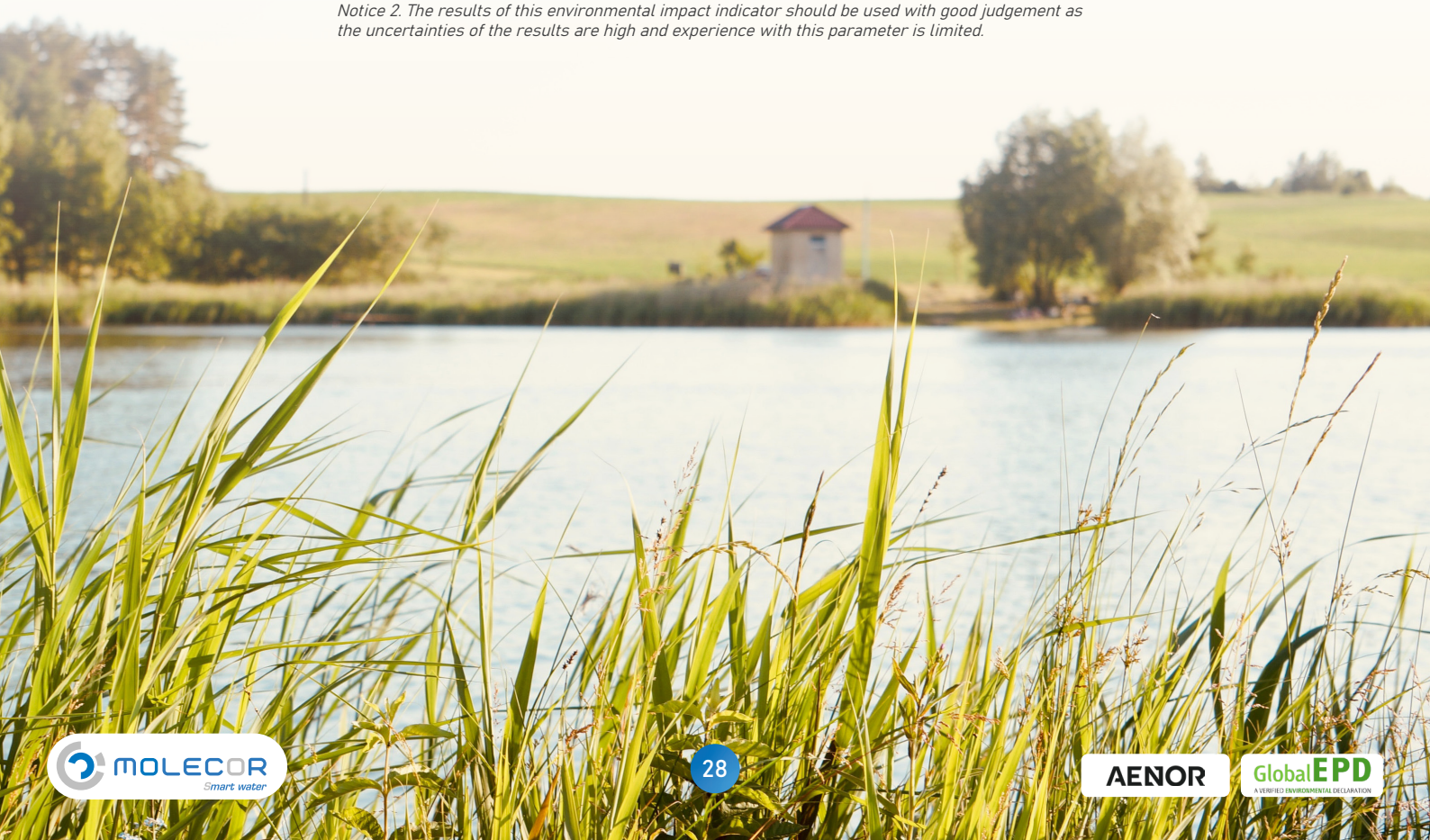
# 5. Declaration of the environmental parameters of the LCA and of the LCI

## Additional environmental impacts

| SANECOR® Declared unit: 1 kilogram | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
| PM | Incidence of diseases | 4.83E-08 | 6.83E-09 | 1.26E-09 | 5.64E-08 | 2.32E-09 | 1.18E-06 | 2.77E-07 | 3.10E-09 | 2.80E-09 | 1.01E-09 | -1.10E-08 |
| IRP 1 | kBq U235 eq | 1.52E-01 | 1.95E-04 | 5.46E-04 | 1.53E-01 | 6.62E-05 | 3.27E-02 | 1.59E-03 | 1.09E-04 | 1.20E-02 | 9.11E-05 | -1.83E-02 |
| ETP-fw [2] | CTUe | 7.33E+00 | 5.77E-01 | 1.19E-01 | 8.03E+00 | 1.92E-01 | 8.50E+01 | 6.46E+00 | 3.04E-01 | 2.40E-01 | 8.58E-01 | -1.68E+00 |
| HTP-c [2] | CTUh | 5.02E-10 | 6.91E-12 | 5.50E-11 | 5.64E-10 | 2.35E-12 | 9.89E-10 | 5.76E-11 | 3.27E-12 | 1.94E-11 | 5.11E-11 | -1.23E-10 |
| HTP-nc [2] | CTUh | 1.43E-08 | 6.14E-10 | 1.20E-10 | 1.50E-08 | 2.65E-10 | 9.50E-08 | 1.44E-09 | 3.66E-10 | 5.38E-10 | 2.03E-09 | -3.55E-09 |
| SQP [2] | Pt | 1.96E+00 | 2.38E-03 | 3.85E+00 | 5.81E+00 | 7.93E-04 | 5.81E-01 | 2.56E-02 | 1.30E-03 | 1.74E-01 | 3.29E-02 | -3.14E-01 |

**PM:** Potential for disease incidence due to emissions of particulate matter;
**IRP:** Exposure efficiency of human potential relative to U235;
**ETP-fw:** Comparative ecosystem toxic unit potential - freshwater;
**HTP-c:** Comparative ecosystem toxic unit potential - carcinogenic effects;
**HTP-nc:** Comparative ecosystem toxic unit potential - non-carcinogenic effects;
**SQP:** Soil quality potential index.

*Notice 1. This impact category deals mainly with the potential impacts of low doses of ionising radiation on human health from the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents and occupational exposure due to the disposal of radioactive waste in underground facilities. The ionising radiation potential of soil, due to radon or some building materials is also not measured in this parameter.*
*Notice 2. The results of this environmental impact indicator should be used with good judgement as the uncertainties of the results are high and experience with this parameter is limited.*



# 5. Declaration of the environmental parameters of the LCA and of the LCI

## Resource use

| SANECOR® Declared unit: 1 kilogram | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
| PERE | MJ, v.c.n. | 2.13E+00 | 3.21E-03 | 7.25E-01 | 2.85E+00 | 1.09E-03 | 5.99E-01 | 2.63E-02 | 1.80E-03 | 2.90E-01 | 3.24E-03 | -4.20E-01 |
| PERM* | MJ, v.c.n. | 0.00E+00 | 0.00E+00 | 6.02E-01 | 6.02E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PERT | MJ, v.c.n. | 2.13E+00 | 3.21E-03 | 1.33E+00 | 3.46E+00 | 1.09E-03 | 5.99E-01 | 2.63E-02 | 1.80E-03 | 2.90E-01 | 3.24E-03 | -4.20E-01 |
| PENRE | MJ, v.c.n. | 4.89E+01 | 1.28E+00 | 3.19E-01 | 5.05E+01 | 4.26E-01 | 1.91E+02 | 1.35E+01 | 6.84E-01 | 1.41E+00 | 1.02E-01 | -1.18E+01 |
| PENRM* | MJ, v.c.n. | 1.96E+01 | 0.00E+00 | 1.27E-01 | 1.97E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PENRT | MJ, v.c.n. | 6.85E+01 | 1.28E+00 | 4.45E-01 | 7.02E+01 | 4.26E-01 | 1.91E+02 | 1.35E+01 | 6.84E-01 | 1.41E+00 | 1.02E-01 | -1.18E+01 |
| SM | kg | 5.46E-02 | 0.00E+00 | 0.00E+00 | 5.46E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RSF | MJ, v.c.n. | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NRSF | MJ, v.c.n. | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW | m3 | 5.13E-02 | 5.41E-05 | 3.75E-04 | 5.17E-02 | 1.78E-05 | 9.23E-03 | 6.76E-04 | 2.87E-05 | 1.07E-03 | 4.33E-04 | -5.91E-03 |

**PERE:** Renewable primary energy use excluding renewable primary energy resources used as raw materials;
**PERM:** Use of renewable primary energy used as raw materials;
**PERT:** Total use of renewable primary energy;
**PENRE:** Non-renewable primary energy use, excluding non-renewable primary energy resources used as raw materials;
**PENRM:** Use of non-renewable primary energy used as raw materials;
**PENRT:** Total use of non-renewable primary energy;
**SM:** Use of secondary materials;
**RSF:** Use of renewable secondary fuels;
**NRSF:** Use of non-renewable secondary fuels;
**FW:** Net use of piped water resources.

** Energy used as raw materials is reported according to option B of the PCR 2019:14 - the energy used as raw materials indicator reflects the energy used as raw materials in product and packaging, and is not further transferred in useful form to another product system.*

## Waste category

| SANECOR® Declared unit: 1 kilogram | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
| HWD | kg | 6.41E-05 | 8.28E-06 | 4.45E-07 | 7.29E-05 | 2.75E-06 | 1.26E-03 | 9.03E-05 | 4.52E-06 | 1.96E-06 | 6.47E-07 | -1.43E-05 |
| NHWD | kg | 4.46E-02 | 6.66E-05 | 1.40E-03 | 4.60E-02 | 2.14E-05 | 1.82E-02 | 1.00E-03 | 3.38E-05 | 1.21E-02 | 3.60E-01 | -7.87E-03 |
| RWD | kg | 1.09E-04 | 1.02E-07 | 4.19E-07 | 1.09E-04 | 3.51E-08 | 1.79E-05 | 6.58E-07 | 5.87E-08 | 9.68E-06 | 6.52E-08 | -1.47E-05 |

**HWD:** Hazardous waste disposed of;
**NHWD:** Non-hazardous waste disposed of;
**RWD:** Radioactive waste disposed of;
**NR:** Not relevant.

# 5. Declaration of the environmental parameters of the LCA and of the LCI

## Outflows

| SANECOR® Declared unit: 1 kilogram | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
| CRU | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.21E+03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MFR | kg | 0.00E+00 | 0.00E+00 | 4.12E-03 | 4.12E-03 | 0.00E+00 | 2.48E-02 | 0.00E+00 | 0.00E+00 | 3.15E-01 | 0.00E+00 | 0.00E+00 |
| MER | 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 | 0.00E+00 | 3.77E-01 | 0.00E+00 |
| EE | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.22E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.10E+00 | 0.00E+00 |

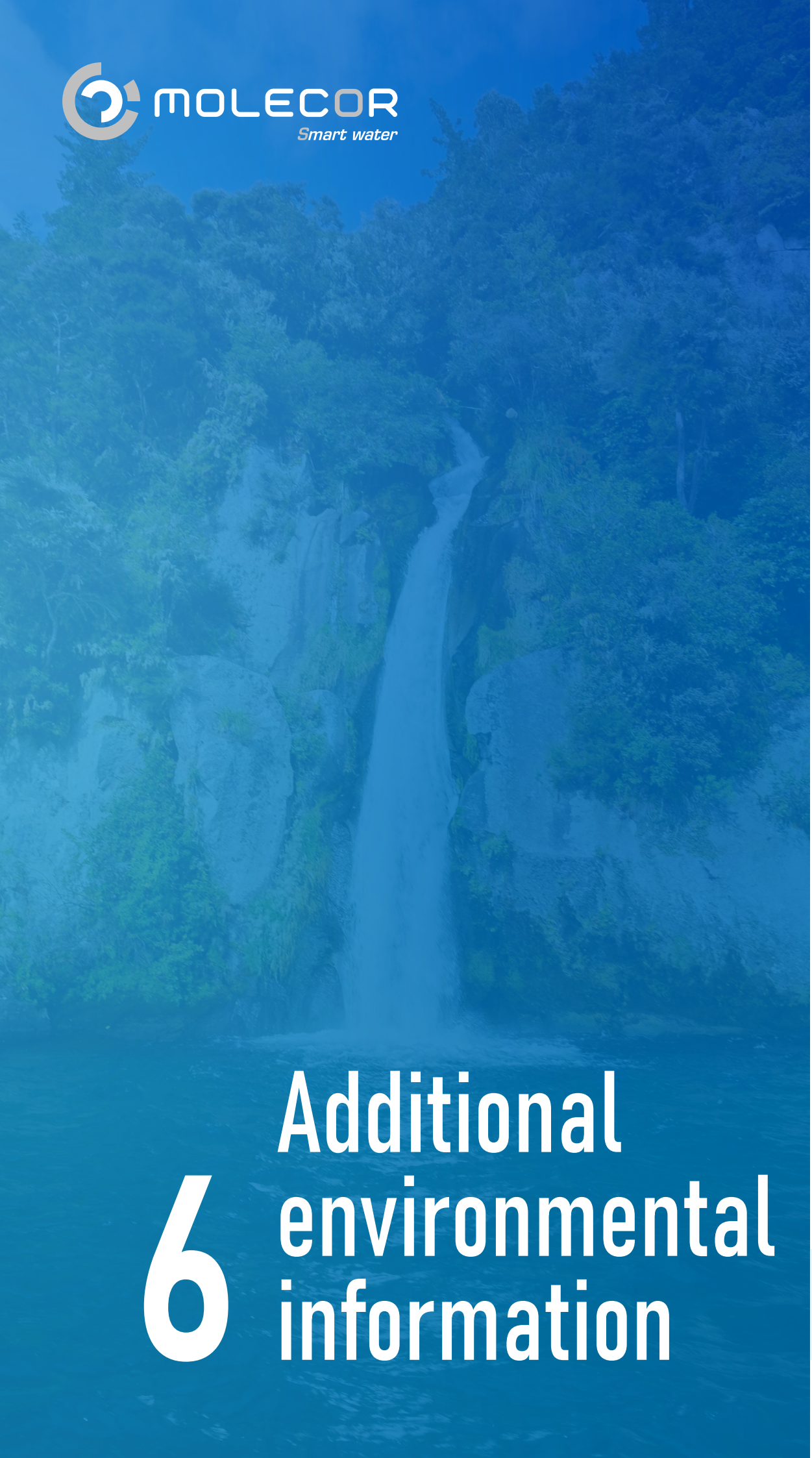
**CRU:** Components for reuse;
**MFR:** Materials for recycling;
**MER:** Materials for energy recovery;
**EE:** Exported energy.

## Biogenic carbon content

The manufacturer declares that the tested TOM® pressurised water supply system and its ecoFITTOM® fittings do not contain any materials with biological content.

The biogenic carbon-containing material used as packaging for the distribution of the elements studied consists of wood and cardboard.

| Biogenic carbon content | Quantity per functional unit |
|---|---|
| Biogenic carbon content of product | 0 |
| Biogenic carbon content of packaging | 1.67-02 kg C |



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# Environmental Product Declaration

## SANECOR® Corrugated PVC System



# 6 Additional environmental information

# 6. Additional environmental information

## 6.1. Other indicators

The production of the components that make up Molecor's SANECOR® sewage system does not generate co-products.

## 6.2. Indoor air emissions

The manufacturer declares that Molecor's SANECOR® sewage system does not generate any emissions to indoor air during its lifetime.

## 6.3. Soil and water emissions

The manufacturer declares that Molecor's SANECOR® sewage system does not generate any emissions to soil or water during its lifetime.

## 6.4. Other environmental issues

There are no known environmental or health problems associated with the manufacture, installation, use and end of life of PVC pipes and fittings.

Molecor's formulations are free from lead stabilisers, and do not contain substances of very high concern (SVHC) such as phthalates or bisphenol A.

The PVC pipes and fittings are resistant to chemicals commonly found in water and sewerage systems, preventing any leaching or release to ground and surface water during use of the pipe system.

In pressure applications, the products have various health certifications in accordance with the applicable legislation in different countries, which certify their suitability for use in the transportation of water for human consumption and, therefore, the non-release of chemical substances into the piped water has been demonstrated.

Depending on different product regulations, the use of recycled material in manufacturing may not be allowed, however, new products are being developed that allow for the use of recycled material and therefore improve their environmental impact. In all cases, all the surplus material from the production processes is reused in the manufacture of new pipes and fittings, thus achieving practically zero PVC waste in all the production plants.

PVC is a 100% recyclable material, therefore, all installed products, once their long life span, estimated at more than 100 years, has been exhausted, can be recycled for the manufacture of other plastic materials.

# References

[1] UNE-EN 15804:2012+A2:2020 Standard. Sustainability in construction. Environmental product declarations. Basic product category rules for construction products.

[2] Illustrative calculation of generic EPD scenarios for Sewer and Drainage [plastic] piping system – TEPPFA. Ref. 2023/SEB/R/2901. February 2023.

[3] General Rules of the GlobalEPD Programme, 2nd revision. AENOR. February 2016.

[4] Databases and environmental impact assessment methodologies applied through SimaPro 9.5.0.0.

[5] UNE-EN ISO 14025:2010 Standard. Environmental labels and declarations. Type III environmental declarations. Principles and procedures. (ISO 14025:2006).

[6] UNE-EN ISO 14040:2006/A1:2021 Standard. Environmental Management. Life Cycle Analysis. Principles and framework. Modification 1. (ISO 14040:2006/Amd 1:2020).

[7] UNE-EN ISO 14044:2006/A1:2021 Standard. Environmental Management. Life cycle assessment. Requirements and guidelines. Modification 2. (ISO 14044:2006/Amd 2:2020).

[8] COMMISSION RECOMMENDATION 2021/2279/EU of 15 December 2021 on the use of common methods for measuring and communicating the environmental performance of products and organisations throughout their life cycle (Published in OJEC on 30/12/2021).

[9] Report on the Life cycle analysis for the EPD of the SANECOR corrugated PVC sewage pipe and its fittings, by Molecor Tecnología S.L. Drawn up by Abaleo S.L., February 2024. Version 5.

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