# ENVIRONMENTAL PRODUCT DECLARATION

## Cubik S Block


| | |
|---|---|
| **PRODUCT NAMES:** | Cubik S Block |
| **SITE PLANTS:** | Vestone |
| **PROGRAM OPERATOR** | EPDItaly |
| **PUBLISHER** | EPDItaly |
| **DECLARATION NUMBER** | 2023CB0001 |
| **REGISTRATION NUMBER** | EPDITALY0408 |
| **ISSUE DATE** | 18/04/2023 |
| **VALID TO** | 18/04/2028 |

in compliance with ISO 14025 and EN 15804:2012+A2:2019.

MADE IN ITALY

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QUALITY FOR PLUMBING

# GENERAL INFORMATION

| | |
|---|---|
| **EPD OWNER:** | Valsir S.p.A., Località Merlaro, 2 25078 Vestone (BS). |
| **PLANT INVOLVED IN THE DECLARATION:** | |

Vestone: Località Merlaro, 2 25078 Vestone (Brescia)

| | |
|---|---|
| **SCOPE OF APPLICATION:** | This Environmental Product Declaration (EPD) is valid for Cubik S Block cistern product. The production facility is in Vestone (BS). The type of declaration is related to an average product produced in Vestone. The life cycle assessment is representative for the product introduced in the declaration for the given system boundaries. |
| **PROGRAM OPERATOR:** | EPDItaly, via Gaetano De Castillia 10, 20124 Milano, Italia. |
| **INDIPENDENT CHECK:** | This declaration has been developed referring to EPDItaly, following the General Programme Instruction; further information and the document itself are available at: www.epditaly.it. EPD document valid within the following geographical area: Italy and other countries according to sales market conditions.<br><br>CEN standard EN 15804 served as the core PCR (PCR ICMQ-001/15 rev.3.0). PCR review was conducted by Daniele Pace.<br>Contact via info@epditaly.it<br><br>Independent verification of the declaration and data, according to EN ISO 14025:2010.<br><br>Third party verifier: ICMQ SpA, via De Castillia, 10 20124 Milano (www.icmq.it)<br><br>☐ EPD process certification (Internal)<br><br>☑ EPD verification (External)<br><br>Accredited by: Accredia |
| **CPC CODE:** | 3632 - Tubes, pipes and hoses, and fittings therefor, of plastics |
| **CORPORATE CONTACT:** | valsir@valsir.it |
| **TECHNICAL SUPPORT:** | Sphera https://www.sphera.com |
| **COMPARABILITY:** | Environmental statements published within the same product category, but from different programs, may not be comparable. In particular, EPDs of construction products may not be comparable if they do not comply with EN 15804. |
| **ACCOUNTABILITY:** | Valsir S.p.A. relieves EPDItaly from any non-compliance with environmental legislation. The holder of the declaration will be responsible for the information and supporting evidence; EPDItaly declines all responsibility for the manufacturer's information, data and results of the life cycle assessment. |
| **REFERENCE DOCUMENT:** | This declaration has been developed following the General Programme Instruction document of EPDItaly, available at www.epditaly.it. |
| **PRODUCT CATEGORY RULES (PCR):** | PCR ICMQ-001/15 rev 3.0<br>EN 15804+A2 is the framework reference for PCRs. |

# COMPANY

## COMPANY

Valsir was founded in 1987, on the basis of a precise industrial strategy adopted by the Silmar Group - a holding that is leader in the plumbing and heating market with a sales turnover of over 900 million Euro and 2,600 employees - with factories in Italy, in Valle Sabbia to the north of Brescia and abroad in Portugal, Poland, Russia, Romania, the Ukraine, France and South Africa.

Valsir is today a solid and expanding firm within a group whose true points of cohesion and strength lie within a strong sense of collaboration and the contribution of specific professional skills of each single component.

### VALSIR - HEADQUARTERS

**Location:** Vestone (BS)

### VALSIR - VOBARNO PRODUCTION PLANT

**Location:** Vobarno (BS)

### VALSIR RECYCLING - CARPENEDA 1 PRODUCTION PLANT

**Location:** Carpeneda, Vobarno (Brescia)

### VALSIR - CARPENEDA 2 PRODUCTION PLANT

**Location:** Carpeneda, Vobarno (Brescia)

## MISSION

Our mission is to excel in the creation of innovative, environmentally sustainable and quality solutions by guaranteeing a meticulous and prompt service. Boasting deep roots within our territory and a strong commitment to internationalization, we adopt processes that are respectful of both people and the environment.

## THE NUMBERS OF VALSIR (2020)

**261,696 m²**

total surface of which 117,334 m² indoors

**585 Employees**

**197,393,953 €**

turnover

**15,751,488 €**

investments

**25 patents**

**28 product lines**

**227 type approvals**

**7,000 items**

## MANAGEMENT SYSTEM AND CERTIFICATIONS

QUALITY SYSTEM CERTIFICATION DNV ISO 9001

### ISO 9001:2015

Quality management system

(In force since 2001)

ENERGY MANAGEMENT SYSTEM DNV·GL ISO 50001

### ISO 50001:2018

Energy management system

(In force since 2017)

ENVIRONMENTAL SYSTEM CERTIFICATION DNV·GL ISO 14001

### ISO 14001:2015

Environmental management systems

(In force since 2018 for the plant in Vestone)

## COMPANY AWARDS

Excellence of the year for Innovation and Leadership - Best Job 2019

LE FONTI AWARDS® WINNER 2019

Singapore Green Building

SINGAPORE GREEN BUILDING COUNCIL

# GOAL AND SCOPE OF EPD

The entire life cycle of the product is considered (Type of EPD: cradle to grave) and the modules described below are declared in this EPD:

- Modules **A1-A3** include those processes that provide energy and material input for the system (A1), transport up to the factory gate of the plant (A2), manufacturing processes, packaging materials as well as waste processing and emissions to air from molding and extrusion processes (A3).
- Module **A4** includes the transport from the production site to the customer or to the point of installation of the products.
- Module **A5** considers all piping systems installation steps (like screws, cement, oil use and water consumption) also packaging waste processing (recycling, incineration, disposal). Credits from energy substitution are declared in module D. During this phase an overlap of 0.5% has been considered.
- Module **B1** considers the use of the installed product. During the use of plastic piping systems, a scenario of zero impact is considered.
- Module **B2** includes the maintenance of the product. A scenario of zero impact is considered.
- Modules **B3-B4-B5** are related to the repair, replacement and refurbishment of the products. If the products are properly installed no repair, replacement or refurbishment processes are necessary. A scenario of zero impact is then considered.
- Modules **B6-B7** consider energy use and operational water to operate building integrated technical systems. No operational energy or water use are considered. A scenario of zero impact is then considered.
- Module **C1** considers deconstruction, including dismantling or demolition of the product from the building site. The energy consumption related to such activities is considered.
- Module **C2** considers transportation of the discarded piping system to a recycling or disposal process.
- Module **C3** considers waste processing for products recycling and incineration.
- Module **C4** includes all waste disposal processes, including pre-treatment and management of the disposal site.
- Module **D** includes benefits from all net flows in the end-of-life stage that leave the product boundary system after having passed the end-of-waste stage. Benefits from packaging incineration (electricity and thermal energy) are declared within module D.

The type of EPD is “cradle to grave” and it is an average EPD for the product Cubik S Block cistern produced in Valsir S.p.A. plant located in Vestone (BS) and sold worldwide. All data refer to the 2019 production and sales.

According to the PCR ICMQ-001/15 rev. 3.0 the LCA study and the relative EPD, is “cradle to grave”. Modules included are A1, A2, A3, A4, A5, B, C and D. All manufacturing activities and packaging/auxiliary’s production are in module A3, while electricity production and input materials are in A1. Transport to clients (A4) and installation (A5) are included together with end of life scenarios (benefits and loads included according to D module).

The declaration is 1c (average product from a specific plant of a specific manufacturer). The production facility is in Vestone (IT). The market range is Worldwide.

| PRODUCT STAGE | | | CONSTRUCTION PROCESS STAGE | | USE STAGE | | | | | | | END OF LIFE STAGE | | | | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Raw material supply | Transport | Manufacturing | Transport from the gate to the site | Assembly | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse- Recovery- Recycling- potential |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |

√ = modules included in the study.

**Geographical validity:** Worldwide

**Database:** GaBi Database 2021.1

**Software:** EPD Process Creator, implemented through GaBi professional 10 and GaBi Envision 9.0 software. The identification code of the EPD process tool used is: Valsir LCA tool - Cisterns v.3 [10/04/2023 - DB Version 2022.2] developed by Sphera.

**EPD realized by means of a validated algorithm:**
In 2022 Valsir S.p.A. implemented and certified a Process for EPD generation by using an algorithm that has been validated and certified by ICMQ S.p.A., in agreement with EPDItaly's requirements. The process is based on an automatic data collection from different manufacturing plants that have been integrated, verified and validated in compliance with internal procedures. The validated algorithm allows the automatic calculation of the indicators reported into the current EPD coming from an LCA model implemented into the EPD process tool.

# PRODUCTS DESCRIPTION

Technological innovation, attention to details and constant quality control, together with the desire to provide our clients with reliability and safety.
These are the cornerstones that have always driven the design and production of Valsir cisterns over the years.
Cubik S represents an absolute novelty on the international scene, a state-of-the-art and innovative product: the first cistern in the world designed to reduce the noise generated during use.

**Figure** Cubik S range.

## 1. CUBIK S BLOCK

It incorporates a painted steel frame that is ideal for installations in light or mixed walls (plasterboard, wood) with wall-hung pans. The depth of 195 mm and the compact WC bend allow installations in all wall types and moreover in technical shafts. The painted surface gives the frame greater corrosion resistance over time.

## Technical data

**Tabella** Typical technical data.

| Charateristics | |
|---|---|
| Thickness: | 195 mm |
| Actuations: | Mechanic |
| | Pneumatic |
| | Electronic |
| Flush volumes: | 6/3, 4.5/3, 4/2 l |
| Standard flush volume: | 6/3 l |
| Push plates standard dimension: | 215 x 145 mm |
| Valsir Design push plate dimension: | Medium |
| CE mark: | EN14055-CL2-NLI |
| | EN14055-CL1-4-NLI-VRII |
| | EN14055-CL1-6-NLI-VRII |
| Ariapur version: | Available |
| WC connection: | Wall-hung pans |
| Suitable for: | Dry walls |
| Load resistance: | In compliance with EN997 |
| Wall fixing kit: | Included |


## Advantages

- The material of the shield is designed to ensure high absorption of acoustic vibrations.
- The cistern is supplied 100% pre-assembled to improve installation speed and simplicity on site.
- The rotating water connection fitting simplifies cistern installation.
- Patented by Valsir, the flush valve guarantees the cleaning of all pan types, including Rimless pans.
- The internal components of Cubik S are certified according to ISO EN 3822, in silence class I both at 3 and 5 bar.
- The different plastic materials of the flush and float valve avoid the formation of limescale.
- Extreme versatility of actuation: mechanical, pneumatic, electronic, electronic and mechanical, or mechanical and pneumatic.
- All rubber components comply with EN 681/WC, a guarantee of their quality and resistance to chemical agents.
- Flush regulation with Cubik S is extremely easy and can be set at 6/3, 4.5/3 and 4/2 liters fully in accordance to water saving philosophy and Green Building requirements.

## 2. FREE-STANDING CUBIK S BLOCK

Made of painted steel, it is designed for installations in light or mixed walls (plasterboard, wall) with a wall-hung pan. Thanks to the peculiar structure of the legs that are anchored to the floor, the frame does not require any other anchor points to the wall structure. The painted surface gives the frame greater corrosion resistance over time.

## Technical data

**Tabella** Typical technical data.

| Charateristics | |
|---|---|
| Thickness: | 160 mm |
| Actuations: | Mechanic |
| | Pneumatic |
| | Electronic |
| Flush volumes: | 6/3, 4.5/3, 4/2 l |
| Standard flush volume: | 6/3 l |
| Push plates standard dimension: | 215 x 145 mm |
| Valsir Design push plate dimension: | Medium |
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## 3. DESCRIPTION OF THE PRODUCTION PROCESSES OF CUBIK S BLOCK

The Cubik S flush cistern mainly consists of three components: the container, the valve and the floating tap.
With the exception of components such as seals and O-rings and the fitting for the stop valve (made of brass by chip removal), all the other components are produced with a moulding process using injection presses. The Cubik S cistern components are of different types, based on their function. In particular, materials such as polypropylene, polystyrene, acetal resin and ABS are used and mixed with dyes when necessary. As for the moulding process, the press receives, through a pneumatic distribution system, the plastic material in granules directly from the storage silos. Once the material has entered the press chamber, it is pushed forward by the screw: during this phase, due to the heating inside chamber, the material reaches the softening point and binds, thus allowing it to be injected through the nozzle into the mould. The latter, consisting of a fixed and a moving part, contains the cavity that is filled with the molten material. Due to the injection, the mould is kept closed with a pressure controlled through special pressure curves defined in the press program for the time required to cool the work piece. At the end of the cycle, the mould opens, the pins used to mould the work piece retract and the component is pushed out of the cavity by the mould ejectors, and then picked up by a robot using a gripper. The robot then unloads the work piece onto the belt that takes it either to the assembly stations on the press (where provided) or to the containers provided.
Then all the components are taken to an assembly line where the different parts are installed inside the cistern container. Quality control includes multiple checks on product compliance both on the single moulded component and on the various kits resulting from the different assembly phases up to the complete cistern.

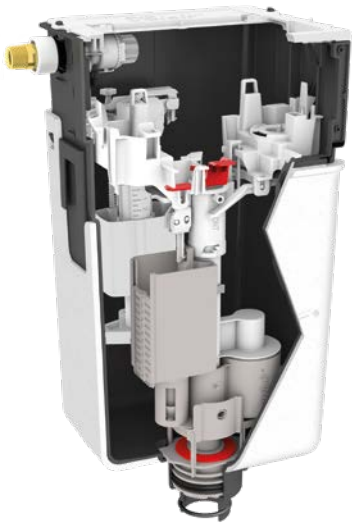
**Figure** Winer S Block production process

## 4. BASE MATERIAL AND ANCILLARY MATERIALS

| Material | [%] |
|---|---|
| ABS | 8.3 |
| Alluminium | 0 |
| ARIAPUR | 0 |
| BRASS | 1.3 |
| Corian | 0 |
| EPDM | 0.2 |
| EPS | 23.3 |
| Glass | 0 |
| HIPS | 1.1 |
| PA | 1.6 |
| PE | 15.3 |
| PP | 1.8 |
| PE/PP [internally regranulated] | 25.4 |
| Pigments ad additives | 0.3 |
| PVC | 0 |
| Resin | 5.1 |
| SBR | 0 |
| Stainless steel/Galvanized steel | 16.3 |
| Zama | 0 |
| Zinc stearate | 0 |
| **TOTAL** | **100%** |

## 5. DESCRIPTION OF COMPONENTS

The environmental burdens are calculated in relation to the functional unit, that refers to 1 complete cistern without packaging.
Main components are stainless and galvanized steel, polypropylene and polyethylene and steel, followed by other polymers such as PE, ABS, polyamide, resin. Ariapur is an additional component working as an extractor fan performing a dual extractor function, thus ensuring the perfect renewal of air inside the bathroom.
The EPD is declared as the average environmental performance for Valsir families of Cubik S Block products to be installed inside a building, over its reference service life cycle of 50 years (being the estimated reference lifetime of the apartment).



## 6. PRODUCTS DISTRIBUTION

Cisterns are supplied to customers in customized dimensions with appropriate protection and packaging. The product packaging is made of cardboard boxes, wooden pallets, polyethylene film and stretch-foil, labels and iron stiches.

## 7. INSTALLATION

Water, fast fixing cement, disposable POM devised for safety reason and electricity are used during installation. No emissions are generated during installation and piping systems installations do not cause health or environmental hazards.

- **Functional unit**

The functional unit is defined as 1 cistern having a weight of 13.67 kg. The service lifetime of the cistern has been considered to be aligned with the 50 year service life time of the apartment".

| Name | Value | Unit |
|---|---|---|
| Reference flow | 15.7 | Kg/FU |
| Moulded components | 6.84262 | Kg/FU |
| Metal components and gaskets | 2,76351 | Kg/FU |
| Plastic components and gaskets | 6,16918 | Kg/FU |
| Motor | 0.0007 | Kg/FU |
| Conversion factor to 1 kg | 0.0637 | |

**Dangerous materials**: The product does not contain any substances included in the "Candidate List of Substances of Very High Concern for Authorization" compliant with /REACH/ and with EC 1272/2008.

The total mass involved is 13.67 kg of which 7.7 kg of moulded components, 3.90 kg of metal components (brass and steel), 2.06 kg of plastic inserts and 0.0007 of Ariapur motor.

- **Condition of use:**

Operational use (pumping energy) is not relevant for the EPD, since it falls outside the system boundaries of the LCA project. The product is compliant with EN 14055:2018, therefore it supports 50 years of continuous use and maintenance is not needed for the Cubik S Block cistern. A scenario of zero impact for cisterns inside the building is considered. Operational use related to energy consumption (B6) is only relevant for ARIAPUR component that is motor driven and it consumes electricity during each flushing cycle.

- **Reference service life**

Cisterns are regarded as having 50 years RSL independent of their material as the building they belong to. The product is compliant with EN 14055:2018, therefore it supports 50 years of continuous use.

- **End of life**

After the demolition and deconstruction phase, cisterns can be incinerated, sent to landfill or recycled.

# LCA RESULTS

The tables below show the results of the CUBIK S Block LCA (Life Cycle Assessment). Additional environmental impact indicators are not declared according to EN 15804 + A2 chapter 7.2.3.2.

**Tabella** Environmental impact per functional unit

| Parameter - Unit | A1 | A2 | A3 | A4 | A5 | B6 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP total [kg $CO_2$-eq.] | 4,44E01 | 7,12E-01 | -1,89E00 | 1,89E00 | 4,05E00 | 0 | 1,58E-01 | 4,04E-01 | 1,33E01 | 3,22E-01 | -1,26E01 |
| GWP fossil [kg $CO_2$-eq.] | 4,41E01 | 7,11E-01 | 1,27E00 | 1,89E00 | 3,38E-01 | 0 | 1,58E-01 | 4,03E-01 | 1,33E01 | 3,21E-01 | -1,26E01 |
| GWP biogenic [kg $CO_2$-eq.] | 2,53E-01 | 9,78E-04 | -3,16E00 | 2,57E-03 | 3,71E00 | 0 | 9,30E-05 | 5,50E-04 | 8,47E-03 | 1,02E-03 | -3,84E-02 |
| GWP luluc [kg $CO_2$-eq.] | 3,01E-02 | 3,12E-05 | 2,34E-03 | 8,13E-05 | 1,73E-04 | 0 | 1,02E-05 | 1,77E-05 | 1,54E-04 | 1,79E-04 | -1,65E-03 |
| ODP [kg CFC-11-eq.] | 5,76E-09 | 7,03E-14 | 3,33E-12 | 1,85E-13 | 2,73E-11 | 0 | 1,56E-12 | 3,99E-14 | 6,76E-12 | 4,47E-13 | -3,52E-10 |
| AP [mole of $H^+$ eq.] | 1,03E-01 | 7,05E-04 | 4,92E-03 | 3,72E-03 | 7,83E-04 | 0 | 2,31E-04 | 3,57E-04 | 3,55E-03 | 1,02E-03 | -1,87E-02 |
| EP - freshwater [kg P eq.] | 8,46E-05 | 1,60E-07 | 1,03E-04 | 4,27E-07 | 6,74E-06 | 0 | 7,07E-08 | 9,08E-08 | 6,30E-06 | 5,68E-05 | -1,00E-05 |
| EP - marine [kg N eq.] | 2,24E-02 | 2,40E-04 | 1,85E-03 | 1,06E-03 | 2,37E-04 | 0 | 6,32E-05 | 1,11E-04 | 1,18E-03 | 2,30E-04 | -5,26E-03 |
| EP - terrestrial [mole of N eq.] | 2,34E-01 | 2,66E-03 | 2,26E-02 | 1,17E-02 | 2,30E-03 | 0 | 6,76E-04 | 1,26E-03 | 1,59E-02 | 2,52E-03 | -5,55E-02 |
| POCP [kg NMVOC eq.] | 7,43E-02 | 6,74E-04 | 6,16E-03 | 3,05E-03 | 8,20E-04 | 0 | 1,79E-04 | 3,33E-04 | 3,13E-03 | 7,33E-04 | -1,76E-02 |
| ADPF* [MJ] | 1,00E03 | 9,60E00 | 9,17E00 | 2,55E01 | 4,70E00 | 0 | 3,34E00 | 5,44E00 | 1,32E01 | 4,53E00 | -2,63E02 |
| ADPE* [kg Sb eq.] | 3,58E-04 | 3,60E-08 | 4,40E-06 | 9,50E-08 | 2,25E-06 | 0 | 1,87E-08 | 2,04E-08 | 1,45E-07 | 2,28E-08 | 1,99E-05 |
| WDP* [$m^3$ world eq.] | 4,12E00 | 1,86E-03 | 2,26E00 | 4,90E-03 | 8,91E-02 | 0 | 1,18E-02 | 1,05E-03 | 1,30E00 | -1,18E-03 | -5,02E-01 |

* The results of this environmental impact indicator should be used with caution because uncertainties about these results are high or because the experience of the indicator is limited.

**GWP** Global warming potential

**ODP** Depletion potential of the stratospheric ozone layer

**AP** Acidification potential of land and water

**EP** Eutrophication potential

**POCP** Formation potential of tropospheric ozone photochemical oxidants

**ADPE** Abiotic depletion potential for non fossil resources

**ADPF** Abiotic depletion potential for fossil resources

**WDP** Water (user) deprivation potential, deprivation-weighted water consumption

# LCA RESULTS

**Tabella** Resource use per functional unit

| Parameter - Unit | A1 | A2 | A3 | A4 | A5 | B6 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PERE [MJ] | 1,30E02 | 5,81E-02 | -1,71E01 | 1,53E-01 | 4,75E00 | 0 | 4,83E-01 | 3,29E-02 | 4,41E00 | 3,87E-01 | -1,63E01 |
| PERM [MJ] | 0 | 0 | 3,17E01 | 0 | -3,98E00 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT [MJ] | 1,30E02 | 5,81E-02 | 1,46E01 | 1,53E-01 | 7,75E-01 | 0 | 4,83E-01 | 3,29E-02 | 4,41E00 | 3,87E-01 | -1,63E01 |
| PENRE [MJ] | 4,76E02 | 9,63E00 | 8,33E00 | 2,56E01 | 3,23E00 | 0 | 3,34E00 | 5,46E00 | 1,80E02 | 4,53E00 | -2,63E02 |
| PENRM [MJ] | 5,25E02 | 0 | 8,53E-01 | 0 | 1,47E00 | 0 | 0 | 0 | -1,67E02 | 0 | 0 |
| PENRT [MJ] | 1,00E03 | 9,63E00 | 9,18E00 | 2,56E01 | 4,70E00 | 0 | 3,34E00 | 5,46E00 | 1,32E01 | 4,53E00 | -2,63E02 |
| SM [kg] | 4,42E00 | 0 | 1,32E00 | 0 | 2,87E-02 | 0 | 0 | 0 | 0 | 0 | 0 |
| RSF* [MJ] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF* [MJ] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FW [$m^3$] | 1,80E-01 | 7,89E-05 | 5,33E-02 | 2,08E-04 | 2,46E-03 | 0 | 7,31E-04 | 4,48E-05 | 3,21E-02 | 1,11E-04 | -3,22E-02 |

* Reference to only foreground system.

**PERE** Use of renewable primary energy as energy carrier

**PERM** Use of renewable primary energy as raw materials

**PERT** Total use of renewable primary energy resources

**PENRE** Use of non-renewable primary energy as energy carrier

**PENRM** Use of non-renewable primary energy as raw materials

**PENRT** Total use of non-renewable primary energy resources

**SM** Use of secondary material

**RSF** Use of renewable secondary fuels

**NRSF** Use of non-renewable secondary fuels

**FW** Use of net fresh water

# LCA RESULTS

**Tabella** Output flows and waste categories per functional unit

| Parameter - Unit | A1 | A2 | A3 | A4 | A5 | B6 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HWD [kg] | 3,02E-05 | 3,33E-11 | 1,28E-07 | 8,87E-11 | 1,51E-07 | | 2,39E-10 | 1,89E-11 | 1,54E-09 | 6,77E-10 | -8,72E-08 |
| NHWD [kg] | 1,12E00 | 9,84E-04 | 1,35E-01 | 2,61E-03 | 2,74E-01 | | 7,10E-04 | 5,58E-04 | 4,29E-01 | 5,39E00 | -1,10E-01 |
| RWD [kg] | 2,09E-02 | 1,59E-05 | 3,50E-04 | 4,19E-05 | 9,26E-05 | | 5,55E-04 | 9,01E-06 | 1,17E-03 | 5,54E-05 | -1,01E-02 |
| CRU [kg] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MFR [kg] | 0 | 0 | 0 | 0 | 1,07E00 | 0 | 0 | 0 | 3,88E00 | 0 | 0 |
| MER [kg] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EEE [MJ] | 0 | 0 | 0 | 0 | 9,52E-01 | 0 | 0 | 0 | 2,43E01 | 0 | 0 |
| EET [MJ] | 0 | 0 | 0 | 0 | 1,38E00 | 0 | 0 | 0 | 4,57E01 | 0 | 0 |

**HWD** Hazardous waste disposed

**NHWD** Non-hazardous waste disposed

**RWD** Radioactive waste disposed

**CRU** Components for re-use

**MFR** Materials for recycling

**MER** Materials for energy recovery

**EEE** Exported electrical energy

**EET** Exported thermal energy

| Parameter - Unit | A1 | A2 | A3 | A4 | A5 | B6 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Biog. C in packaging [Kg] | 0 | 0 | 7,56E-001 | 0 | 3,78E-003 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biog. C in product [Kg] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Biog. C in packaging** Biogenic carbon content in packaging

**Biog. C in product** Biogenic carbon content in product

# CALCULATION RULES

## ASSUMPTIONS

Where possible, a conservative approach has been adopted, overestimating burdens to prove irrelevance. In other cases, alternatives data were selected based on scientific experience in order to improve the accuracy of the model. Where it was not possible to know the precise composition of materials in the supply chain (due to commercial or industrial confidential suppliers' reasons or due to missing datasets), these have been approximated with LCIs of similar materials, estimated by the combination of available dataset or reconstructed with literature data.

- Lead batteries have been taken into account as a conservative choice for batteries used in forklift.
- For brass recycling the steel billet recycling process has been used as conservative choice (melting temperature for recycling brass is lower than for steel).
- Where potential benefits from energy recovery in A5 and C modules are considered, for rest of world countries (other than Europe) these are calculated based on the European grid mix.
- For boilers (natural gas fed) an efficiency factor equal to 0.95 is considered.
- The functional unit is defined without packaging.
- In case of transports on truck where the payload was neither available nor conceivable, utilization factor of 0.61 has been considered (empty way back).
- For masterbatches/pigments whose exact composition was not available, a 95% of main polymer has been considered in addition to 5% pigment and in case of recycling, the avoided burden of the polymer is calculated for the total amount (avoided burden of the polymer also for the pigment part).
- For millings used to mill plastic scraps from internal manufacturing activities whose specific consumption was not available, an average between Bivite's and Govoni's milling consumption has been taken.
- For metal components end of life, a 60% recycling percentage has been considered based on /ISPRA/ reference, 40% is sent to landfill.
- For distribution an estimated distance of 500 km by truck is added to the transport via ship.
- Distance to disposal site after demolition is assumed to be 100 km.
- For end of life scenarios, as Building&Construction (ISPRA) update percentage for Italy did only consider the overall recovery percentage, not distinguishing between recycling and energy recovery, the relative proportion has been assumed to be the same as in /PLASTIC EUROPE (2010)/ containing specific information for 2010.
- For plastic systems installation scrap production an average product has been considered, taking into account a worst case approach not including the related packaging.
- For cisterns installation scrap production the same composition as the product under study has been considered, with no packaging included.
- Whenever transport distances were not available (i.e. C2 module) a general 100 km has been considered.
- As different type of pigments were used, a generic pigment polymer-based has been considered (95% LDPE + 5% average pigment).

## CUT-OFF RULES

In the assessment, all available data from production process are considered, i.e. all raw materials used, utilized thermal energy, and electric power consumption using best available LCI datasets. Thus material and energy flows contributing less than 1% of mass or energy are considered. Production of capital equipment, facilities and infrastructure required for manufacture are outside the scope of this assessment. The sum of the excluded material flows does not exceed 5% of mass, energy or environmental relevance.

## DATA QUALITY

The data quality can be considered as good. The LCA models have been checked and most relevant flows were considered. Technological, geographical and temporal representativeness is appropriate.

## EXAMINATION PERIOD

Primary data collected in the context of this study refer to 2019.

## ALLOCATION - UPSTREAM DATA

Information about single datasets is documented in http://database-documentation.gabi-software.com/support/gabi/.

# SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

- Module **A1** refers to all raw materials impacts production with packaging included and all types of energy inputs
- Module **A2** includes the raw materials (also auxiliary's and packaging) transport to the factory gate
- Module **A3** comprises all production activities and waste treatment and process emissions (both to air and to water). Such activities refer to VALSIR direct activities. Primary data have been used for plastic injection moulding and processes link to cistern manufacturing.
- Module **A4** takes into account the transport to the final customer/distributor. In 2019, Cubik S Block product was sold to Europe (67.19%), to Italy (9.98%) and to the rest of the world 22.84%). The distribution scenario is shown below:

| | | | GaBi transport dataset | |
|---|---|---|---|---|
| **Product** | **IT** | **EU** | **Truck [km]** | **Ship [km]** |
| | | | Truck-trailer, Euro 6, up to 28t gross weight / 12,4t payload capacity | Average ship, 27500 dwt payload capacity/ocean going |
| Cubik S Block | 9.98% | 67.19% | 1163.99 | 222.63 |

- For Module **A5** the following parameters have been taken into account:

| Cisterns installation | |
|---|---|
| Scrap percentage [%] | 0.5 |
| Water [kg] | 6 |
| Fast fixing cement [kg] | 0.032 |
| POM satefy device [kg] | 0.006 |
| Electrical energy [kWh] | 0.008 |
| Water for cement [kg] | 0.014 |

- Module B (maintenance and operational use): Operational use and Maintenance are not relevant for the cistern. A general scenario of zero impact for cisterns is considered for modules B1-B2-B3-B4-B5-B7.
- Operational energy use (B6) is relevant in case of ARIAPUR component that is motor-driven. 200.000 cycles have been considered in the cistern life time and 10 minutes of motor use (20 Watt-powered) for each cycle with an overall consumption for piece equal to 666 kWh in the overall life cycle.
- Module **C1** (Deconstruction / demolition) has been included and deconstruction impacts have been considered.
- Module **C2**, **C3** (recycling and incineration with energy recovery) and **C4** (landfilling) consider the end of life scenarios of the product, considering all components of the piping system. The percentages to the given scenarios have been suggested by /FprEN 16904/ as shown below:

**Tabella** End of life scenarios for plastics.

| Scenario | Italy | Europe | Rest of World |
|---|---|---|---|
| Source | /PLASTIC EUROPE (2020)./ /ISPRA/ | /PLASTIC WASTE FROM B&C IN EU 2018/ | / |
| Recycling | 31[1] /64[2]*36%=17% | 26% | 0 |
| Incineration | 33[3] /64*36%=19% | 47.5% | 0 |
| Landfill | 64% | 26.5% | 100% |

[1] Recycling percentage for B&C waste in Italy /PLASTIC EUROPE (2020)/
[2] Recycling + Energy recovery for B&C waste in Italy /PLASTIC EUROPE (2020)
[3] Energy recovery for B&C waste in Italy /PLASTIC EUROPE (2020)/

**Tabella** End of life scenarios for metals

| Scenario | Italy | Europe | Rest of World |
|---|---|---|---|
| Source | /ISPRA/ | | / |
| Recycling | 60% (conservative assumption) | 60% (conservative assumption) | 0 |
| Landfill | 40% | 40% | 0 |

The end of life stage refers to four EPD modules: C1, C2, C3, C4, and module D, which collect all resulting loads and recycling potentials arising within the studied system.

- Module **D** consists of loads and benefits beyond the system boundaries.

# OTHER ADDITIONAL ENVIRONMENTAL INFORMATION

## EMISSIONS TO INDOOR AIR:

No direct emissions at the building site. Valsir S.p.A. confirms that the Cubik S Block product does not contain any substances mentioned on the REACH-list.

## EMISSIONS TO SOIL AND WATER:

No direct emissions at the building site. Valsir S.p.A. confirms that the Cubik S Block product does not contain any substances mentioned on the REACH-list.

# REFERENCES


| | |
|---|---|
| **CEN/TR 15941** | Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data; CEN/TR 15941:2010 |
| **CPR** | Regulation (EU) No 305/2011 of the European parliament and of the council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC |
| **EN 15804+A2** | EN 15804:2012+A2:2019: Sustainability of construction works -Environmental Product Declarations - Core rules for the product category of construction products |
| **EN ISO 14025** | EN ISO 14025:2011-10 Environmental labels and declarations - Type III environmental declarations - Principles and procedures |
| **EN ISO 14040** | EN ISO 14040:2009-11 Environmental management - Life cycle assessment - Principles and framework |
| **EN ISO 14044** | EN ISO 14044:2006-10 Environmental management - Life cycle assessment - Requirements and guidelines |
| **GABI TS** | GaBi ts dataset documentation for the software-system and databases, LBP, University of Stuttgart and Sphera, Leinfelden-Echterdingen, 2021 (http://documentation.gabi-software.com/) |
| **GHG PROTOCOL** | World Resource Institute, wbcsd, Product Life Cycle Accounting and Reporting Standard. September 2011; http://www.ghgprotocol.org/standards/product-standard |
| **GUINÉE 2001** | Guinée et al, An operational guide to the ISO-standards, Centre for Milieukunde (CML), Leiden, the Netherlands, 2001 |
| **PCR ICMQ 3.0** | ICMQ-001/15, 2017– rev.3: Prodotti da costruzione e servizi per costruzioni, EPD Italy. Data di emissione: 02/12/2019, validità fino al: 01/12/2024. |
| **REGOLAMENTO EPDITALY V.5.2** | Regolamento del Programma EPDItaly. Data di emissione:16/02/2022 |
| **ISO 15686** | ISO 15686:2011-05, Buildings and constructed assets - Service life planning |
| **EN 14055:2018** | EN 14055:2018 - WC and urinal flushing cisterns |
| **ISPRA** | Rapporti rifiuti speciali, ISPRA 2020 |
| **FPREN 16904** | Plastics piping systems - Environmental product declarations - Product Category rules complementary to EN 15804, for plastic piping systems inside buildings. |
| **EUROSTAT** | EUROSTAT Data browser: Packaging waste by waste management operations https://ec.europa.eu/eurostat/databrowser/view/ENV_WASPAC__custom_344983/default/table?lang=en |
| **COREPLA** | https://www.corepla.it/<br><br>https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwivqNya4vjvAhVLm6QKHWJ3BOQQFjAAegQIBhAD&url=https%3A%2F%2Fwww.corepla.it%2Fdocumenti%2F060bbd18-7fbf-4b76-b9b8-d28f4a973607%2FRELAZIONE%2BSULLA%2BGESTIONE%2B2019.pdf&usg=AOvVaw2LuwjziOZqFmIdV20AvQz7 |
| **COMIECO** | https://www.comieco.org/25deg-rapporto-annuale-comieco-sulla-raccolta-differenziata-di-carta-e-cartone-in-italia/ |

| | |
|---|---|
| **RILEGNO** | http://www.rilegno.org/rapporto-2020/ |
| **PLASTIC EUROPE (2010)** | Analysis of recovery of plastic waste in the building and construction sector (2020). Recovery and disposal of plastic B&C waste in EU27+2 and by country (2020). |
| **PLASTIC WASTE FROM B&C IN EU 2018** | Final report “Plastic waste from B&C in EU 2018” . Overview plastic waste from building & construction by polymer type and by recycling, energy recovery and disposal - Building & construction post consumer plastic waste generation EU 28+2 in 2018 (kt), Plastic Europe 2018 |
| **REACH** | The Candidate List of Substances of Very High Concern (SVHC). Pursuant to Article 59(10) of the REACH Regulation (EC) No 1907/2006. https://echa.europa.eu/it/candidate-list-table |

WASTE SYSTEMS

SUPPLY SYSTEMS

GAS SYSTEMS

FLUSHING SYSTEMS

BATHROOM SYSTEMS

TRAPS

RADIANT SYSTEMS

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