**STT TÜRK GAZBETON**

THE INTERNATIONAL EPD® SYSTEM

TÜRKİYE EPD®
THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM
EPD VERIFIED

# Environmental Product Declaration

## Autoclaved Aerated Concrete

Manufactured by **STT Yatırım Yapı San. ve. Tic. A.Ş.** in accordance with ISO 14025 and EN 15804:2012+A2:2019/AC:2021

| | |
|---|---|
| **Programme:** | **The International EPD® System** |
| **Programme Operator:** | **EPD International AB** |
| **Local Operator:** | **EPD Türkiye** |
| **S-P Code:** | **S-P-10628** |
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| **Geographical Scope:** | **Global** |

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com.

# Programme Information

ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR)

**Product Category Rules (PCR):**

PCR 2019:14 Construction products, version 1.3.1, Construction EN 15804:2012+A2:2019/AC:2021 Sustainability of Construction Works

PCR review was conducted by: The Technical Committee of the International EPD® System. Review chair: Claudia A. Peña, University of Concepción, Chile

EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison.

**Third-party verification**

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

EPD verification by individual verifier

Third party verifier: Prof. Ing. Vladimír Kočí, Ph.D., Šárecká 5,16000 Prague 6 - Czech Republic

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes          x No

STT Yatırım Yapı San. ve. Tic. A.Ş. has the sole ownership, liability, and responsibility for this EPD.

**The International EPD® System**

**EPD International AB
Box 210 60 SE-100 31
Stockholm, Sweden
www.environdec.com**

# How to read this EPD?

An Environmental Product Declaration (EPD) is an ISO Type III Environmental Declaration based on ISO 14025 standard. An EPD transparently reports the environmental performance of products or services from a lifecycle perspective. The preparation of an EPD includes different stages, from acquiring raw materials to the end of life of the final product/service. EPDs are based on international standards and consider the entire value chain. Additionally, EPD is a third-party verified document. This EPD includes several sections described below.

## 1. General and Program Information

The first part of an EPD has information about the name of the manufacturer and product/service and other general information such as the validity and expiration dates of the document, the name of the program operator, geographical scope, etc. The second page states the standards followed and gives information about the program operator, third-party verifier, etc. The followed Product Category Rule (PCR) is indicated on the second page.

## 2. Company and Product/Service Information

Information about the company and the investigated product is given in this section. It summarizes the characteristics of the product provided by the manufacturer. It also includes information about the product such as product composition and packaging.

## 3. LCA Information

LCA information is one of the most important parts of the EPD as it describes the functional/declared unit, time representativeness of the study, database(s) and LCA software, along with system boundaries.

The table presented in this part has columns for each stage in the life cycle. The considered stages are marked 'X' whereas the ones that are not considered are labeled as 'NR'. Not all EPDs consider the full life cycle assessment for a product's entire life stages. The 'System Boundary' page is also the place where one can find detailed information about the stages and the assumptions made.

## 4. LCA Results

The results of the Life Cycle Assessment analysis are presented in table format. The first column in each table indicates the name of the impact category and their measurement units are presented in the second column. These tables show an amount at each life cycle stage to see the impact of different indicators on different stages. Each impact can be understood as what is released through the production of the declared unit of the material—in this case, 1 $m^3$ of autoclave aerated concrete. The benefits of reuse/recycling of the declared product is reflected in this section.

The first impact in the table is global warming potential (GWP), which shows how much $CO_2$ is released at each stage. Other impacts include eutrophication potential, acidification potential, ozone layer depletion, land use related impacts, etc. The second table provides results for resource use and the third table is about the waste produced during the production. The fourth and final table shows the results for the GWP-GHG indicator, which is almost equivalent to the GWP-Total indicator mentioned previously. The only difference is that this indicator excludes the biogenic carbon content by following a certain methodology.

# About STT TÜRK GAZBETON

Our founder Mr.M.Tansu TUĞLU, who has great experience for more than 30 years in cement, ready-mix concrete, autoclaved aerated concrete (AAC), mining and construction sectors, has decided to invest in AAC business.

In 2022, STT Yatırım Yapı San.ve Tic.A.Ş. purchased two AAC plants belonging formerly to AKG Gazbeton A.Ş. One of them is located and was built on 96 acres with a closed area of 22 acres. The other one is located in Kırıkkale and was built on 110 acres with a closed area of 24 acres. Our company obtained its registered trademark as STT TÜRK GAZBETON and started production.

Our produciton has gained on important position in AAC business with its Çorlu plant, having the largest annual production capacity of 630.000 m³ in Europe and Kırıkkale plant having annual capacity of 570.000 m³. Our total annual production capacity is 1.200.000 m³.

STT TÜRK GAZBETON having one of the widest product range in AAC sector in Turkey, produces three main products called block products, reinforced products and insulation plates.

## About the product

Aerated autoclave concrete (AAC) is the first preference of contemporary world as a building material, providing buildings with multifarious contributions.

- It is a porous and lightweight building material.
- In terms of volume, 70-80% of it consists of pores.
- AAC is a massive material with low density.
- Furthermore, it is the masonry wall material with the lowest heat conductivity.

STT TÜRK GAZBETON having one of the widest product ranges in AAC sector in Türkiye, produces three main products called block products, reinforced products and insulation plates. Block products are load bearing and/or non-load bearing blocks having with or without tongue-groove profiles, lightweight hollow blocks, U-blocks and insulation plates. Reinforced products are vertical and horizontal wall panels, partition walls, lintels and jambs. AAC is a non-flammable A1 class product and has high thermal insulation properties.



### Why AAC?

Thanks to its high performance and economic properties, AAC is being produced globally from USA to Japan. It is widely used in the most popular buildings cities around the world and meets significant market demand for improving the fire and earthquake safety of buildings.

### A Building Material that Adds Value to Projects

Thanks to its economical, natural, comfort and quality characteristics and speed it provides; AAC is used in any kind of residences, social and touristic facilities as well as commercial and industrial buildings.

The product investigated in this EPD is STT TÜRK GAZBETON's autoclaved aerated concrete produced at companies two production plants located at Kırıkkale and Tekirdağ provinces in Türkiye. Manufacturer has a range of AAC production between 350 - 600 kg/m$^3$. The chosen dry weight of the product for this EPD is 400 kg/m$^3$. Thus, life cycle assessment analyses for this specific weight have been conducted for two production sides. Types of materials and the production routes are the same between the two production sites. There are only small changes in material quantities. According to the LCA anaylsis, there is less than 10% environmental performance difference between two sites. Thus, results in this EPD covers both sites. Below tables show average material and packaging content of the investigated product for the specified volume. The material percentages below are provided for wet weight content.

| Material | *Weight percentage (%) |
|---|---|
| Silica sand | 50 - 60 |
| Cement | 24 - 28 |
| Lime | 6 - 10 |
| Gypsum | 4 - 6 |
| Aluminum paste | < 1.0 |

*The weight percentages are for dry weight of the product. There is approximately 300 kg of water use per declared unit. Significant portion of this water does remain in the final product.

| **Material | Weight percentage (%) |
|---|---|
| Polyethylene (shrink & stretch) | 100 |

**There is also use of wooden pallets for the shipment of the product. For the considered weight, around 1 piece of pallet is used. However, the pallets are used many times before it becomes useless, thus its environmental impacts per declared unit of production remains relatively low. Thus, impact of using wooden pallet is neglected in the analysis.

Technical specifications of the autoclaved aerated concrete are provided in the table below.

| Characteristics/Class | G2/350 | G2/400 | G2/500 | G3/500 | G4/600 | Standard |
|---|---|---|---|---|---|---|
| Mean Compressive Strength (N/mm²) | ≥ 2.2 | ≥ 2.5 | ≥ 3.0 | ≥ 3.5 | ≥ 5.0 | EN 772-1 |
| Mean Dry Bulk Density (kg/m³) | 350 | 400 | 500 | 500 | 600 | EN 772-13 |
| Maximum Thermal Conductivity $\lambda_{10, dry}$ (W/m.K ) | 0.10 | 0.11 | 0.13 | 0.13 | 0.16 | EN 12664 |
| Maximum Drying Shrinkage (mm/m) | 0.2 | | | | | EN 680 |
| Fire Class (Euroclass) | A1 | | | | | EN 13501-1 |

**A1 - Raw Material Supply**

This stage includes the impacts of raw materials extraction and pre-treatment processes before production. Included raw materials are lime, portland cement, gypsum, silica sand, and aluminium paste. Production related impacts of these materials before used in AAC production is considered.

**A2 - Raw Material Transport**

This stage includes transportation related impacts of materials for the production of AAC blocks. Dominantly highway transportation is involved at this stage. Transport routes and distances are supplier-specific and provided by the manufacturer.

**A3 - Manufacturing**

This stage includes production-related environmental impacts of the investigated product. Main steps of AAC productions are pulverization of raw materials into fine powder, pre-curing, cutting, steam pressure curing, and final packaging. All energy-related inputs are provided by the manufacturer.

**A4 - Final product shipment**

Transport routes and distances are supplier-specific and provided by the manufacturer with consideration of two production sites.

**A5 - Installation**

During the installation of AAC blocks at site, bonding mortar should be used. There is approximately 12-15 kg use of bonding mortar per 1 m$^3$ installation. Thus, impact of bonding mortar use is considered at this stage.

**B1 - Use/Application**

Due to the CaO content of the cement and lime used in the product, AAC blocks absord $CO_2$ during their lifetime. Theoretical $CO_2$ uptake by carbonation process is calculated by considering the CaO content within cement and lime with reference to the Hartmut B. Walther (2018).

**C1 - Deconstruction/Demolition**

It is assumed that 0.239 MJ energy is needed for the deconstruction/demolition of 1 kg of final product. This is from the JRC technical report called "Model for Life Cycle Assessment (LCA) of buildings" prepared by Dos Santos Gervasio, H. and Dimova, S. in 2018 published by the publication's office of the European Union. According to this assumption, 95.6 MJ, (0.239 MJ * 400 kg) of electricity energy is needed for the deconstruction/demolition of the product.

**C2 - Waste Transport**

100 km waste transport distance via trucks is assumed at this stage.

**C3 - Waste Processing**

This module is considered as zero since there is no need for the after-life processes of the product.

**C4 - Disposal**

Based on the sector practices, it is assumed that 100% of the AAC block is landfilled at the end-of-life stage. Thus, this stage is modelled accordingly.

**D - Reuse, recovery, or recycling potential**

Since 100% of the AAC block is assumed to be landfilled, there is no future benefit or potential attributed to this stage.

# LCA Information

### Declared Unit
1 m³ autoclaved aerated concrete manufactured by STT Yatırım Yapı San. ve. Tic. A.Ş.

### Conversion Factor
1 m³ of Autoclaved Aerated Concrete weights 400 kg. Thus a mass conversion factor of 0.0025 should be used.

### System Boundary
Cradle to gate with options, modules C1–C4, module D and with optional modules (A4, A5 & B1).

### Cut-Off Rules
1% cut-off is applied. Data for elementary flows to and from the product system contributing to a minimum of 99% of the declared environmental impacts have been included.

### REACH Regulation
No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH regulations are present in this product either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

### Background Data
For LCA modelling and calculation, ecoinvent database (v3.9.1) and SimaPro (v9.5) LCA software were used.

### Biogenic Carbon Content
The product does not contain biogenic carbon content.

### Period Under Review
The data used for LCA study concerns between March 2023 - October 2023.

### Allocations
Energy consumptions were weighted according to production figures within the selected period. In addition, hazardous and non-hazardous waste amounts were also allocated from the total waste generation for the same period.

# LCA Information

| | Product Stage | | | Construction Process Stage | | Use Stage | | | | | | | End of Life Stage | | | | Benefits and Loads |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Raw Material Supply | Transport | Manufacturing | Transport | Construction Installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational Energy Use | Operational Water Use | Deconstruction / Demolition | Transport | Waste Processing | Disposal | Future reuse, recycling or energy recovery potentials |
| **Module** | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| **Modules Declared** | X | X | X | X | X | X | ND | ND | ND | ND | ND | ND | X | X | X | X | X |
| **Geography** | GLO | GLO | TR | GLO | GLO | GLO | - | - | - | - | - | - | GLO | GLO | GLO | GLO | GLO |
| **Specific Data Used** | >90% | | | | | - | - | - | - | - | - | - | - | - | - | - | - |
| **Variation - Products** | 0% | | | | | - | - | - | - | - | - | - | - | - | - | - | - |
| **Variation - Sites** | <10% | | | | | - | - | - | - | - | - | - | - | - | - | - | - |

(X = Module included, ND = Not declared)

LCA Results

| Core environmental impact indicators (Mandatory) | Unit | A1-A3 | A4 | A5 | B1 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| GWP - Fossil | kg $CO_2$ eq. | 1.37E+02 | 9.42E+00 | 3.20E+00 | -5.66E+01 | 1.54E+01 | 7.69E+00 | 0.00E+00 | 3.75E+00 | 0.00E+00 |
| GWP - Biogenic | kg $CO_2$ eq. | 7.19E-02 | 5.11E-03 | 5.21E-02 | 0.00E+00 | 5.33E-02 | 1.99E-03 | 0.00E+00 | 3.87E-03 | 0.00E+00 |
| GWP - Luluc | kg $CO_2$ eq. | 2.14E-01 | 4.85E-03 | 2.16E-03 | 0.00E+00 | 1.82E-01 | 3.96E-03 | 0.00E+00 | 2.70E-03 | 0.00E+00 |
| GWP - Total | kg $CO_2$ eq. | 1.37E+02 | 9.43E+00 | 3.25E+00 | -5.66E+01 | 1.56E+01 | 7.70E+00 | 0.00E+00 | 3.76E+00 | 0.00E+00 |
| ODP | kg CFC-11 eq. | 1.04E-06 | 1.41E-07 | 1.76E-08 | 0.00E+00 | 1.03E-07 | 1.15E-07 | 0.00E+00 | 1.19E-07 | 0.00E+00 |
| AP | mol H+ eq. | 4.19E-01 | 3.33E-02 | 1.21E-02 | 0.00E+00 | 1.10E-01 | 2.72E-02 | 0.00E+00 | 2.60E-02 | 0.00E+00 |
| EP - Freshwater | kg P eq. | 2.93E-02 | 7.65E-04 | 4.56E-04 | 0.00E+00 | 1.76E-02 | 6.24E-04 | 0.00E+00 | 2.14E-02 | 0.00E+00 |
| EP - Marine | kg N eq. | 1.04E-01 | 1.10E-02 | 3.42E-03 | 0.00E+00 | 1.84E-02 | 8.94E-03 | 0.00E+00 | 9.00E-03 | 0.00E+00 |
| EP - Terrestrial | mol N eq. | 1.11E+00 | 1.16E-01 | 3.69E-02 | 0.00E+00 | 1.65E-01 | 9.48E-02 | 0.00E+00 | 9.58E-02 | 0.00E+00 |
| POCP | kg NMVOC | 3.46E-01 | 4.48E-02 | 1.09E-02 | 0.00E+00 | 4.83E-02 | 3.66E-02 | 0.00E+00 | 3.63E-02 | 0.00E+00 |
| *ADPE | kg Sb eq. | 1.49E-04 | 3.01E-05 | 8.42E-06 | 0.00E+00 | 1.65E-05 | 2.46E-05 | 0.00E+00 | 6.35E-06 | 0.00E+00 |
| *ADPF | MJ | 1.00E+03 | 1.33E+02 | 2.17E+01 | 0.00E+00 | 1.60E+02 | 1.08E+02 | 0.00E+00 | 1.05E+02 | 0.00E+00 |
| *WDP | $m^3$ depriv. | 5.03E+01 | 5.87E-01 | 6.38E-01 | 0.00E+00 | 8.58E+00 | 4.79E-01 | 0.00E+00 | 4.99E+00 | 0.00E+00 |
| **Additional environmental impact indicators (Mandatory)** | | | | | | | | | | |
| **GWP-GHG | kg $CO_2$ eq. | 1.38E+02 | 9.44E+00 | 3.26E+00 | -5.66E+01 | 1.56E+01 | 7.71E+00 | 0.00E+00 | 3.77E+00 | 0.00E+00 |
| **Additional environmental impact indicators (Optional)** | | | | | | | | | | |
| PM | disease inc. | 3.69E-06 | 7.48E-07 | 1.57E-07 | 0.00E+00 | 5.00E-07 | 6.11E-07 | 0.00E+00 | 4.98E-07 | 0.00E+00 |
| ***IR | kBq U-235 eq. | 2.57E+00 | 1.13E-01 | 6.12E-02 | 0.00E+00 | 1.27E-01 | 9.22E-02 | 0.00E+00 | 7.50E-02 | 0.00E+00 |
| ETP-FW | CTUe | 2.78E+02 | 7.39E+01 | 1.10E+01 | 0.00E+00 | 4.36E+01 | 6.04E+01 | 0.00E+00 | 7.09E+01 | 0.00E+00 |
| *HTP - C | CTUh | 3.67E-08 | 4.26E-09 | 1.13E-09 | 0.00E+00 | 3.29E-09 | 3.48E-09 | 0.00E+00 | 9.90E-08 | 0.00E+00 |
| *HTP - NC | CTUh | 1.84E-06 | 9.51E-08 | 2.43E-08 | 0.00E+00 | 1.34E-07 | 7.77E-08 | 0.00E+00 | 3.46E-06 | 0.00E+00 |
| *SQP | Pt | 3.94E+02 | 7.90E+01 | 2.44E+01 | 0.00E+00 | 1.58E+01 | 6.45E+01 | 0.00E+00 | 3.79E+02 | 0.00E+00 |
| Acronyms | GWP-total: Climate change, GWP-fossil: Climate change- fossil, GWP-biogenic: Climate change - biogenic, GWP-luluc: Climate change - land use and transformation, ODP: Ozone layer depletion, AP: Acidification terrestrial and freshwater, EP-freshwater: Eutrophication freshwater, EP-marine: Eutrophication marine, EP-terrestrial: Eutrophication terrestrial, POCP: Photochemical oxidation, ADPE: Abiotic depletion - elements, ADPF: Abiotic depletion - fossil resources, WDP: Water scarcity, PM: Respiratory inorganics - particulate matter, IR: Ionising radiation, ETP-FW: Ecotoxicity freshwater, HTP-c: Cancer human health effects, HTP-nc: Non-cancer human health effects, SQP: Land use related impacts, soil quality. | | | | | | | | | |
| Legend | A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A4: Transport, A5: Installation, B1: Use, C1: Demolition, C2: Waste Transport, C3: Waste Processing, C4: Disposal, D: Future reuse, recycling or energy recovery potentials | | | | | | | | | |

**Information on biogenic carbon content according to EN 15804+A2**

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

| Indicators describing resource use (Mandatory) | Unit | A1-A3 | A4 | A5 | B1 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ | 7.78E+01 | 1.68E+00 | 2.43E+00 | 0.00E+00 | 5.32E+01 | 1.38E+00 | 0.00E+00 | 9.51E-01 | 0.00E+00 |
| PERM | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PERT | MJ | 7.78E+01 | 1.68E+00 | 2.43E+00 | 0.00E+00 | 5.32E+01 | 1.38E+00 | 0.00E+00 | 9.51E-01 | 0.00E+00 |
| PENRE | MJ | 1.00E+03 | 1.33E+02 | 2.17E+01 | 0.00E+00 | 1.60E+02 | 1.08E+02 | 0.00E+00 | 1.05E+02 | 0.00E+00 |
| PENRM | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PENRT | MJ | 1.00E+03 | 1.33E+02 | 2.17E+01 | 0.00E+00 | 1.60E+02 | 1.08E+02 | 0.00E+00 | 1.05E+02 | 0.00E+00 |
| SM | 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 |
| RSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NRSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW | m$^3$ | 4.02E+00 | 2.25E-02 | 4.56E-02 | 0.00E+00 | 6.48E-02 | 1.84E-02 | 0.00E+00 | 1.20E-01 | 0.00E+00 |
| Acronyms | PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy, PENRE: Use of non-renewable primary energy excluding resources used as raw materials, PENRM: Use of non-renewable primary energy resources used as raw materials, PENRT: Total use of non-renewable primary energy, SM: Secondary material, RSF: Renewable secondary fuels, NRSF: Non-renewable secondary fuels, FW: Net use of fresh water. | | | | | | | | | | |

| Environmental information describing waste categories (Mandatory) | Unit | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| HWD | kg | 4.80E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NHWD | kg | 1.10E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RWD | 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 |

| Environmental information describing output flow (Mandatory) | Unit | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CRU | 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 |
| MFR | 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 |
| 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 |
| EE (Electric) | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| EE (Thermal) | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Acronmys | HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed, CRU: Components for reuse, MFR: Material for recycling, MER: Materials for energy recovery, EE (Electrical): Exported energy electrical, EE (Thermal): Exported energy thermal. | | | | | | | | | |
| *Disclamer 1 | The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. | | | | | | | | | |
| **Disclamer 2 | GWP-GHG = Global Warming Potential total excl. biogenic carbon following IPCC AR5 methodology. The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013 | | | | | | | | | |
| ***Disclamer 3 | 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. | | | | | | | | | |

# References

GPI/ General Programme Instructions of the International EPD® System. Version 4.0.

EN 15804:2012+A2:2019 Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

DIN EN ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN ISO 14040:2014 Environmental management – Life cycle assessment - Principles and framework

EN ISO 14044:2014 Environmental management – Life cycle assessment - Requirements and guidelines

ISO 14020: common terms and definitions, principles and general requirements for all environmental statements (e.g. self-declared environmental claims, ecolabels, EPDs and footprint communications) and associated programmes that enable the communication of environmental aspects and environmental impacts of products.

PCR for Construction Products and Construction Services/ Prepared by IVL Swedish Environmental Research Institute, Swedish environmental Protection Agency, SP Trä, Swedish Wood Preservation Institute, Swedisol, SCDA, Svenskt Limträ AB, SSAB, The International EPD System, 2019:14 Version 1.3.1

The International EPD® System/ The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025. www.environdec.com

Directive (EG) No. 1907/2006 of the European Parliament and of the Council dated 18 December 2006 on the registration, evaluation, approval and restriction of chemical substances (REACH), for establishing a European Agency for chemical substances, for amending Directive 1999/45/EC and for annulment of Directive (EEC) No. 793/93 of the Council, Directive (EC) No. 1488/94 of the Commission, Guideline 76/769/EEC of the Council and Guidelines 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC of the Commission

EN 197-1:2011 Cement Part 1: Composition, specifications and conformity criteria for common cements

SimaPro software for LCA calculations, developed by PRé Sustainability, Stationsplein 121, 3818 LE Amersfoort, Netherlands, https://simapro.com

Ecoinvent dataset, developed by the Swiss Centre for Life Cycle Inventories, Technoparkstrasse 1,8005 Zurich, Switzerland https://ecoinvent.org/

www.sttyatirim.com.tr

## Contact Information

| | | |
|---|---|---|
| **Programme & Programme operator** | The International EPD® System<br>www.environdec.com<br><br>THE INTERNATIONAL EPD® SYSTEM | EPD registered through fully aligned regional programme: EPD Türkiye<br>www.epdturkey.org<br>info@epdturkey.org<br>NEF O9 B Blok No:7/15, 34415<br>Kağıthane/İstanbul, TÜRKİYE<br><br>TÜRKIYE EPD®<br>THE INTERNATIONAL EPD® SYSTEM |
| **Owner of the declaration** | İncilipınar Mah.Nişantaşı Sok. Elit İş Merkezi No: 11/44<br>Şehitkamil / Gaziantep / TÜRKİYE<br><br>STT TÜRK GAZBETON | Contact person: Abdullah Tan<br>Phone: +90 342 215 08 05<br><br>E-mail:  info@sttyatirim.com.tr<br><br>www.sttyatirim.com.tr |
| **LCA practitioner and EPD Design** | Metsims Sustainability Consulting<br><br>Türkiye:<br>Nef 09 B Blok NO:7/46-47<br>34415 Kagıthane/Istanbul, TÜRKIYE<br>+90 212 281 13 33<br><br>metsims Sustainability Consulting | The United Kingdom:<br>4 Clear Water Place<br>Oxford OX2 7NL, UK<br>0 800 722 0185<br><br>www.metsims.com<br>info@metims.com |
| **Independent verifier** | LCA.cz<br><br>Prof. Ing. Vladimír Kočí, Ph.D., | Šárecká 5,16000<br>Prague 6 - Czech Republic<br>www.lca.cz |