# ENVIRONMENTAL PRODUCT DECLARATION

*In accordance with EN 15804 and ISO 14025*

## COMFORT SA SLAB 50

Date of publication: 2019-07-01
Validity: 5 years
Valid until: 2024-06-24
**Based on** PCR 2012:01 Construction products and construction services v 2.3 (EN 15804:2012+A1) and its Sub-PCR-I Thermal insulation products (EN 16783)
**UN CPC CODE:** 37990
**Scope of the EPD®:** Gulf Cooperation Council (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates)

Registration number
The International EPD® System:
S-P-01532

**EPD®**

**KIMMCO ISOVER** SAINT-GOBAIN

# General information

**Manufacturer:** Saudi International Insulation manufacturing company (SIIMCO)
**Programme used:** The International EPD® System. More information at www.environdec.com
**EPD® registration number:** S-P-01532
**PCR identification**: PCR 2012:01 Construction products and construction services v 2.3 (EN 15804:2012+A1) and its Sub-PCR-I Thermal insulation products (EN 16783)
**UN CPC CODE:** 37990
**Owner of the declaration:** Kimmco-Isover Saint Gobain. Building No. 8753,  Zip Code 46478, 6th Light Industrial Park Yanbu, Kingdom of Saudi Arabia
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**Declaration issued:** 2019-07-01, **valid until**: 2024-06-23

| EPD program operator | The International EPD® System. Operated by EPD® International AB. www.environdec.com. |
|---|---|
| PCR review conducted by | The Technical Committee of the International EPD® System |
| **LCA and EPD® performed by LCA Central Team** | |
| **Independent verification of the environmental declaration and data according to standard EN ISO 14025:2010** | |
| Internal ☐ | External ☒ |
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# Product description

**Product description and description of use:**

This Environmental Product Declaration (EPD®) describes the environmental impacts of 1 m² of mineral wool with a thermal resistance of 1.0  $K*m^2*W^{-1}$ and 36 mm of thickness which is a not commercialized product.

The production site of KIMMCO-ISOVER (Saudi Arabia) uses natural and abundant raw materials of natural origin ((i. e. volcanic rock) and recycled materials, using fusion and fiberising techniques to produce stone wool. The products obtained from mineral wools are characterized by its lightness due to its air containing structure that keeps immobile between its intertwined filaments.

On Earth, the best insulator is dry immobile air. At 24°C its thermal conductivity factor, expressed in λ, is 0.025 W/(m.K) (watts per meter Kelvin degree). The thermal conductivity of mineral wool is close to immobile air, and its lambda value is between 0,033 W/(m·K) for the most efficient wools to 0.040 W/(m.K) to the least efficient ones.

With its entangled structure, mineral wool is a porous material that traps the air, making it one of the best insulating materials. The porous and elastic structure of the wool also absorbs noise in the air, knocks and offers acoustic correction inside premises. Mineral wool containing incombustible materials does not fuel fire or propagate flames.

Stone wool insulation is used in buildings as well as industrial facilities. It ensures a high level of comfort, lowers energy costs which minimizes carbon dioxide ($CO_2$) emissions during use phase, prevents heat loss through roofs, walls, floors, boilers and industrial equipment's reduces noise pollution and protects homes, commercial and industrial facilities from the risk of fire.
Stone wool products last for the average building's lifetime (which is often set at 50 years as a default), or as long as the insulated building component is part of the building.

**Technical data/physical characteristics (for a not commercialized product of a thickness of 36 mm and R=1):**

Thermal resistance of the Product: 1 K.m².$W^{-1}$ (EN 12667, ASTM C518)
The thermal conductivity of the stone wool is: 0.036 W/(m·K) (EN 12667, ASTM C518)
Reaction to fire: None combustible - A1 (EN13501-1, ASTM E136)
Water vapor transmission: ~1 (EN 10456, ASTM E96)

**Description of the main components and/or materials for 1 $m^2$ of product with a thermal resistance of 1.0 K.$m^2$.$W^{-1}$ for the calculation of the EPD®:**

| PARAMETER | VALUE |
|---|---|
| **Quantity of wool for 1 $m^2$ of product** | 1.8 Kg |
| **Thickness of wool** | 36 mm |
| **Surfacing** | None |
| **Packaging for the transportation and distribution** | Polyethylene (with print): 0,072 kg/m² Label paper: 0.01 kg/m² |
| **Product used for the Installation** | None |

During the life cycle of the product any hazardous substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization[1]" has not been used in a percentage higher than 0.1% of the weight of the product.

The verifier and the program operator do not make any claim nor have any responsibility of the legality of the product.

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[1] http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp

# LCA calculation information

| | |
|---|---|
| **FUNCTIONAL UNIT** | Providing a thermal insulation on 1 m² of product with a thermal resistance of 1.0 $K.m^2.W^{-1}$ |
| **SYSTEM BOUNDARIES** | Cradle to Grave: Mandatory stages = A1-3, A4-5, B1-7, C1-4. Optional stage = D not taken into account |
| **REFERENCE SERVICE LIFE (RSL)** | 50 years |
| **CUT-OFF RULES** | In the case that there is not enough information, the process energy and materials representing less than 1% of the whole energy and mass used can be excluded (if they do not cause significant impacts). The addition of all the inputs and outputs excluded cannot be bigger than the 5% of the whole mass and energy used, as well of the emissions to environment occurred. Flows related to human activities such as employee transport are excluded.<br><br>The construction of plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the production of the building product when compared at these systems lifetime level. |
| **ALLOCATIONS** | Allocation criteria are based on mass |
| **GEOGRAPHICAL COVERAGE AND TIME PERIOD** | Gulf Cooperation Council, it members states are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates Saudi Arabia. Year of data collection: 2018 |

- "EPDs of construction products may be not comparable if they do not comply with EN 15804"
- "Environmental Product Declarations within the same product category from different programs may not be comparable"

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# Life cycle stages

*Flow diagram of the Life Cycle*
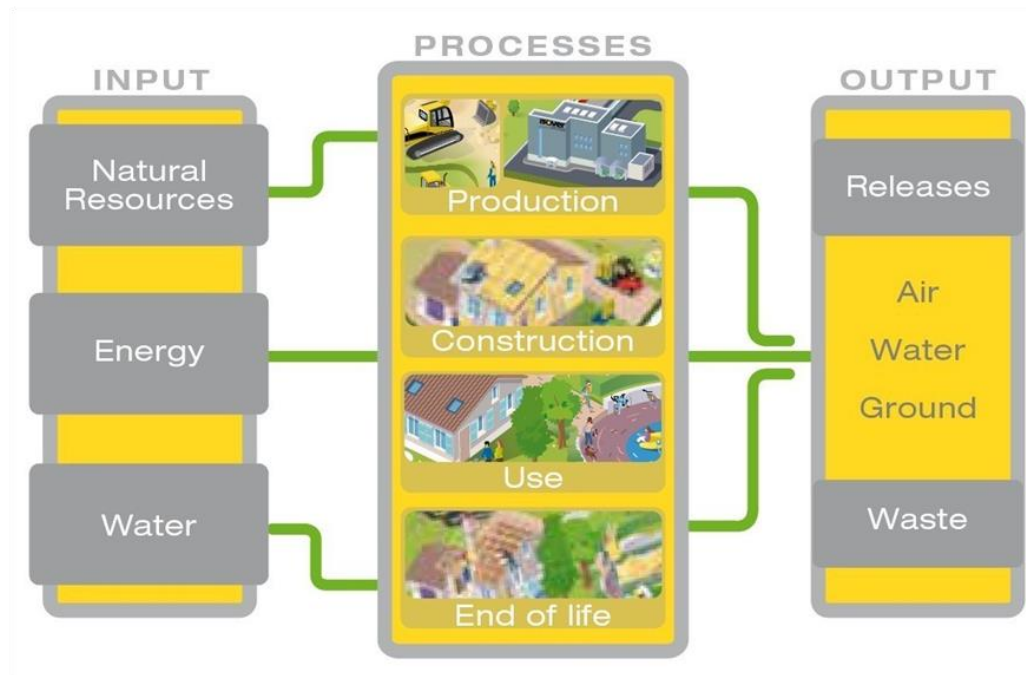


## Product stage, A1-A3

**Description of the stage:** the product stage of the stone wool products is subdivided into 3 modules A1, A2 and A3 respectively "Raw material supply", "transport" and "manufacturing".

The aggregation of the modules A1, A2 and A3 is a possibility considered by the EN 15 804 standard. This rule is applied in this EPD.

**Description of the scenarios and other additional technical information**:

**A1, Raw materials supply**
This module takes into account the extraction and processing of all raw materials and energy which occur upstream to the studied manufacturing process

Specifically, the raw material supply covers production of binder components and sourcing (quarry) of raw materials for fiber production. Besides these raw materials, recycled materials (agglomerates) are also used as input.

**A2, Transport to the manufacturer**
The raw materials are transported to the manufacturing site. In our case, the modeling include: road (average values) of each raw material.

**A3, Manufacturing**
This module includes the manufacturing of the product and packaging. Specifically, it covers the manufacturing resin, stone wool (including the processes of fusion and fiberizing showed in the flow diagram), and the packaging.
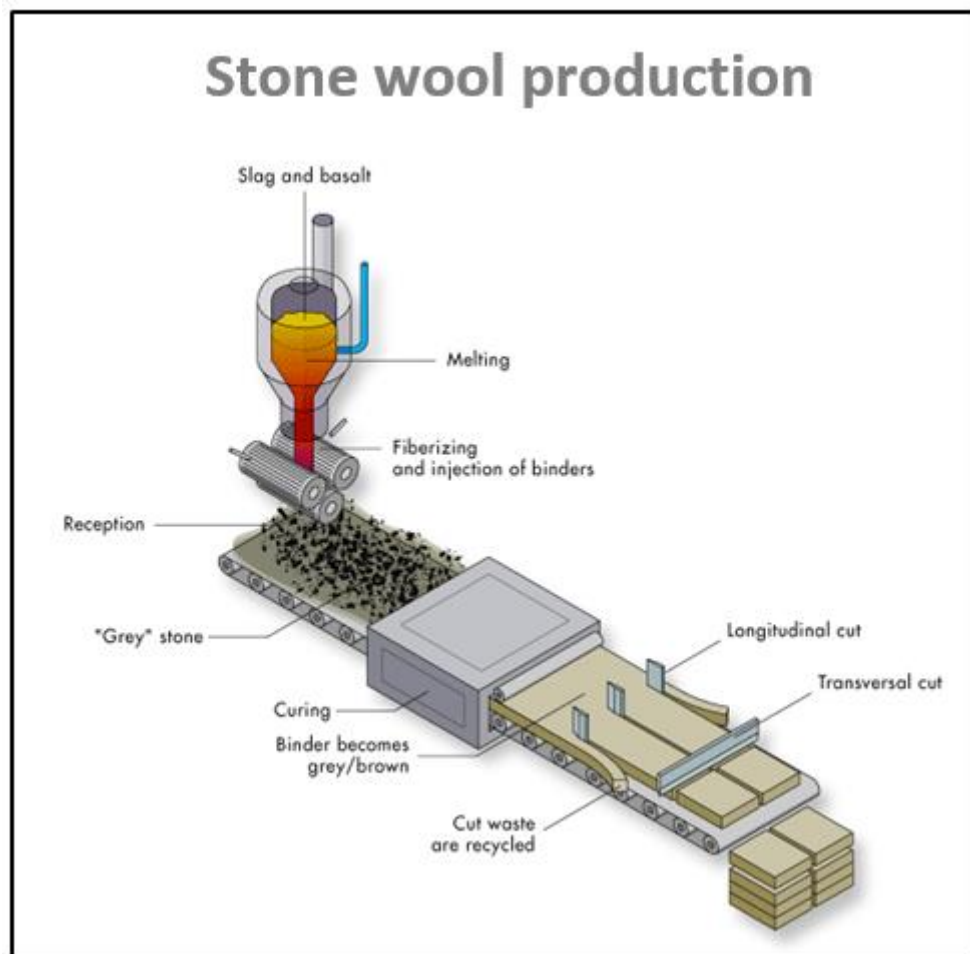
## Construction process stage, A4-A5

**Description of the stage:** the construction process is divided into 2 modules: A4, transport to the building site and A5, installation in the building.

**A4, Transport to the building site:** this module includes transport from the production gate to the building site.
Transport is calculated on the basis of a scenario with the parameters described in the following table.

| PARAMETER | VALUE/DESCRIPTION |
|---|---|
| **Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat, etc.** | Average truck trailer with a 27 t payload, diesel consumption 38 liters for 100 km |
| **Distance** | 1500 km |
| **Capacity utilisation (including empty returns)** | 100 % of the capacity in volume 0 % of empty returns |
| **Bulk density of transported products*** | 50 kg/m$^3$ |
| **Volume capacity utilisation factor** | 1 |

**A5, Installation in the building:** this module includes:

No additional accessory is used for the implementation phase of the insulation product.

| PARAMETER | VALUE/DESCRIPTION |
|---|---|
| **Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)** | 5 % |
| **Distance** | 25 km to landfill by truck |
| **Output materials (specified by type) as results of waste processing at the building site e.g. of collection for recycling, for energy recovering, disposal (specified by route)** | Packaging wastes are 100 % collected and modeled as landfilled<br><br>Stone wool losses are landfilled |

## Use stage (excluding potential savings), B1-B7

**Description of the stage:** the use stage is divided into the following modules:
- B1: Use
- B2: Maintenance
- B3: Repair
- B4: Replacement
- B5: Refurbishment
- B6: Operational energy use
- B7: Operational water use

**Description of the scenarios and additional technical information:**
Once installation is complete, no actions or technical operations are required during the use stages until the end of life stage. Therefore, stone wool insulation products have no impact (excluding potential energy savings) on this stage.

# End of Life Stage, C1-C4

**Description of the stage:** this stage includes the next modules:

**C1, Deconstruction, demolition**
The de-construction and/or dismantling of insulation products take part of the demolition of the entire building. In our case, the environmental impact is assumed to be very small and can be neglected

**C2, Transport to waste processing**
The model use for the transportation (see A4, transportation to the building site) is applied.

**C3, Waste processing for reuse, recovery and/or recycling**
The product is considered to be landfilled without reuse, recovery or recycling.

**C4, Disposal**
The stone wool is assumed to be 100% landfilled.

**Description of the scenarios and additional technical information:**

**End of life:**

| PARAMETER | VALUE/DESCRIPTION |
|---|---|
| **Collection process specified by type** | The entire product, including any surfacing is collected alongside any mixed construction waste<br><br>1.8 kg of stone wool (collected with mixed construction waste) |
| **Recovery system specified by type** | There is no recovery, recycling or reuse of the product once it has reached its end of life phase. |
| **Disposal specified by type** | The product alongside the mixed construction waste from demolishing will go to landfill<br><br>1.8 kg of stone wool are landfilled |
| **Assumptions for scenario development (e.g. transportation)** | We assume that the waste going to landfill will be transported by truck with 24 tons payload, using diesel as a fuel consuming 38 liters per 100km.<br>Distance covered is 25 km |

# Reuse/recovery/recycling potential, D

**Description of the stage:** module D has not been taken into account.

# LCA results

LCA model, aggregation of data and environmental impact are calculated from the Gabi software (version 8.7) CML 4.1 impact method has been used, together with Gabi version 2019 and ecoinvent 3.1 databases to obtain the inventory of generic data.

Raw materials and energy consumption, as well as transport distances have been taken directly from the manufacturing plant (Production data according 2018 and transport data according 2018)

All figures refer to a functional unit of 1 m² of mineral wool with a thermal resistance of 1.0 $K*m^2*W^{-1}$ for a thickness of 36mm, which is a not commercialized thickness, For obtain the result of commercial thickness please address to the conversion factor in addition information section.

## ENVIRONMENTAL IMPACTS

| Parameters | Product stage | Construction stage | | Use stage | | | | | | | End of life stage | | | | D Reuse, recovery, recycling |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Operational energy use | B7 Operational water use | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | |
| Global Warming Potential (GWP) - kg CO2 equiv/FU | 6,47E+00 | 1,39E-01 | 3,26E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 8,54E-03 | 0 | 2,88E-02 | MND |
| The global warming potential of a gas refers to the total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas, carbon dioxide, which is assigned a value of 1. | | | | | | | | | | | | | | | |
| Ozone Depletion (ODP) kg CFC 11 equiv/FU | 8,35E-07 | 2,13E-17 | 4,18E-08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 4,75E-12 | 0 | 1,61E-16 | MND |
| Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbons or halons), which break down when they reach the stratosphere and then catalytically destroy ozone molecules. | | | | | | | | | | | | | | | |
| Acidification potential (AP) kg SO2 equiv/FU | 2,02E-02 | 5,56E-04 | 1,02E-03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 3,49E-05 | 0 | 1,65E-04 | MND |
| Acid depositions have negative impacts on natural ecosystems and the man-made environment incl, buildings. The main sources for emissions of acidifying substances are agriculture and fossil fuel combustion used for electricity production, heating and transport. | | | | | | | | | | | | | | | |
| Eutrophication potential (EP) kg (PO4)3- equiv/FU | 2,80E-03 | 1,36E-04 | 1,42E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 8,37E-06 | 0 | 1,87E-05 | MND |
| Excessive enrichment of waters and continental surfaces with nutrients, and the associated adverse biological effects. | | | | | | | | | | | | | | | |
| Photochemical ozone creation (POPC) kg Ethene equiv/FU | 1,70E-03 | 2,04E-05 | 8,57E-05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 1,30E-06 | 0 | 1,36E-05 | MND |
| Chemical reactions brought about by the light energy of the sun. The reaction of nitrogen oxides with hydrocarbons in the presence of sunlight to form ozone is an example of a photochemical reaction. | | | | | | | | | | | | | | | |
| Abiotic depletion potential for non-fossil resources (ADP-elements) - kg Sb equiv/FU | 1,79E-06 | 1,85E-09 | 9,00E-08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 1,27E-10 | 0 | 9,81E-09 | MND |
| Abiotic depletion potential for fossil resources (ADP-fossil fuels) - MJ/FU | 1,05E+02 | 1,94E+00 | 5,26E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,00E+00 | 1,19E-01 | 0 | 3,84E-01 | MND |
| Consumption of non-renewable resources, thereby lowering their availability for future generations. | | | | | | | | | | | | | | | |

| Parameters | Product stage | Construction process stage | | Use stage | | | | | | | End of life stage | | | | D Reuse, recovery, recycling |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Operational energy use | B7 Operational water use | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | |
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials - *MJ/FU* | 1,37E+00 | 4,5E-02 | 7,1E-02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,7E-03 | 0 | 5,1E-02 | MND |
| Use of renewable primary energy used as raw materials *MJ/FU* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | MND |
| Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) *MJ/FU* | 1,37E+00 | 4,5E-02 | 7,1E-02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,7E-03 | 0 | 5,1E-02 | MND |
| Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - *MJ/FU* | 1,07E+02 | 2,0E+00 | 5,4E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,2E-01 | 0 | 4,0E-01 | MND |
| Use of non-renewable primary energy used as raw materials *MJ/FU* | 3,87E+00 | 0 | 1,9E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | MND |
| Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - *MJ/FU* | 1,11E+02 | 2,0E+00 | 5,6E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,2E-01 | 0 | 4,0E-01 | MND |
| Use of secondary material *kg/FU* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | MND |
| Use of renewable secondary fuels- *MJ/FU* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | MND |
| Use of non-renewable secondary fuels - *MJ/FU* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | MND |
| Use of net fresh water - *m3/FU* | 1,71E-02 | 1,5E-05 | 8,6E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,0E-06 | 0 | 1,0E-04 | MND |

| | Parameters | Product stage | Construction process stage | | Use stage | | | | | | | End-of-life stage | | | | D Reuse, recovery, recycling |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Operational energy use | B7 Operational water use | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | |
| | **WASTE CATEGORIES** | | | | | | | | | | | | | | | |
| | Hazardous waste disposed *kg/FU* | 2,55E-09 | 6,98E-09 | 5,23E-10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,25E-10 | 0 | 6,78E-09 | MND |
| | Non-hazardous waste disposed *kg/FU* | 1,12E-01 | 2,36E-05 | 1,02E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,44E-06 | 0 | 1,85E+00 | MND |
| | Radioactive waste disposed *kg/FU* | 1,73E-04 | 2,27E-06 | 8,96E-06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,38E-07 | 0 | 5,28E-06 | MND |

| Parameters | Product stage | Construction process stage | | Use stage | | | | | | | End-of-life stage | | | | D Reuse, recovery, recycling |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Operational energy use | B7 Operational water use | C1 Deconstruction / demolition | C2 Transport | C3 Waste processing | C4 Disposal | |
| **OTHER OUTPUT FLOWS** | | | | | | | | | | | | | | | |
| Components for re-use kg/FU | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | MND |
| Materials for recycling kg/FU | 0 | 0 | 8,20E-02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | MND |
| Materials for energy recovery kg/FU | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | MND |
| Exported energy MJ/FU | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | MND |

# LCA interpretation

The following figure refers to a functional unit 1 m² of mineral wool with a thermal resistance of 1.0 K*m²*W⁻¹ for a thickness of 36 mm.

| | Product (A1-A3) | Transport (A4) | Installation (A5) | Use (B) | End-of-life (C) | Total — Environmental impacts of the product |
|---|---|---|---|---|---|---|
| **Global warming** (kg CO₂equiv/FU) | 6,47 | 0,14 | 0,33 | 0,00 | 0,04 | **6,97** kg CO₂equiv/FU |
| **Non-renewable resources consumption** [1] (MJ/FU) | 105,00 | 1,94 | 5,26 | 0,00 | 0,50 | **112,70** MJ/FU |
| **Energy consumption** [2] (MJ/FU) | 112,37 | 1,99 | 5,65 | 0,00 | 0,57 | **120,59** MJ/FU |
| **Water consumption** [3] (m³/FU) | 0,0171 | 0,0000 | 0,0009 | 0,0000 | 0,0001 | **0,02** m³/FU |
| **Waste production** [4] (kg/FU) | 0,11 | 0,00 | 0,10 | 0,00 | 1,85 | **2,06** kg/FU |

*[1] This indicator corresponds to the abiotic depletion potential of fossil resources.*

*[2] This indicator corresponds to the total use of primary energy.*

*[3] This indicator corresponds to the use of net fresh water.*

*[4] This indicator corresponds to the sum of hazardous, non-hazardous and radioactive waste disposed.*

### Global Warming Potential (Climate Change) (GWP)

When analyzing the above figure for GWP, it can clearly be seen that the majority of contribution to this environmental impact is from the production modules (A1 – A3). This is primarily because the sources of greenhouse gas emissions are predominant in this part of the life cycle. CO2 is generated upstream from the production of electricity and is also released on site by the combustion of natural gas. We can see that other sections of the life cycle also contribute to the GWP; however the production modules contribute to 89% of the contribution. Combustion of fuel in transport vehicles will generate the second highest percentage of greenhouse gas emissions.

### Non-renewable resources consumptions

We can see that the consumption of non – renewable resources is once more found to have the highest value in the production modules. This is because a large quantity of natural gas is consumed within the factory, and non – renewable fuels such as natural gas and coal are used to generate the large amount of electricity we use. The contribution to this impact from the other modules is very small and primarily due to the non – renewable resources consumed during transportation.

**Energy Consumptions**

As we can see, modules A1 – A3 have the highest contribution to total energy consumption. Energy in the form of electricity and natural gas is consumed in a vast quantity during the manufacture of stone mineral wool so we would expect the production modules to contribute the most to this impact category.

**Water Consumption**

As we don't use water in any of the other modules (A4 – A5, B1 – B7, C1 – C4), we can see that there is no contribution to water consumption. For the production phase, water is used within the manufacturing facility and therefore we see the highest contribution here. However, we recycle a lot of the water on site so the contribution is still relatively low.

**Waste Production**

Waste production does not follow the same trend as the above environmental impacts. The largest contributor is the end of life module. This is because the entire product is sent to landfill once it reaches the end of life state. However, there is a still an impact associated with the production module since we do generate waste on site. The very small impact associated with installation is due to the loss rate of product during implementation.

# Additional information

## Electricity Production

| TYPE OF INFORMATION | DESCRIPTION |
| --- | --- |
| Location | Representative of average production in Saudi Arabia (2015) |
| Geographical representativeness description | Split of energy sources in Saudi Arabia<br>- Fuel oil: 41.1%<br>- Gas: 51.9 %<br>- Solar PV: 1%<br>Distribution losses: 7.0 % |
| Reference year | 2015 |
| Type of data set | Cradle to gate |
| Source | IEA |
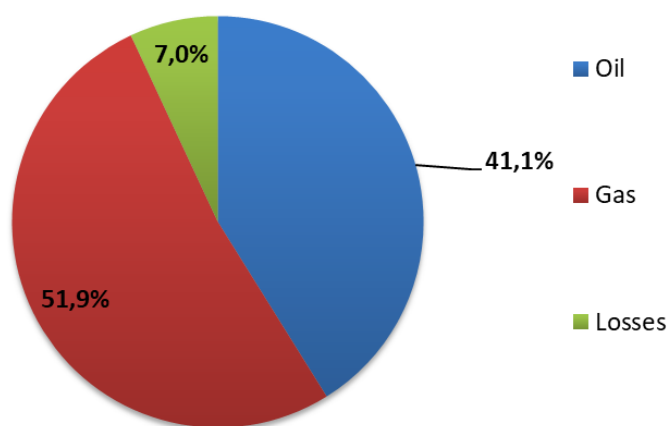
The dataset used to model the electricity mix for the calculation comes from ecoinvent database.

| DATA SOURCE | AMOUNT | UNIT |
|---|---|---|
| Ecoinvent (2014, v3.1) | 0.87 | kg CO2 eq /KWh |

## Influence of particular thickness

This EPD includes a range of thicknesses, from 30 to 220 mm, using a multiplication factor in order to obtain the environmental performance of every thickness. In order to calculate the multiplication factors, a reference unit has been selected with a value of R=1 m2*K/W for 37 mm of thickness. All results refer to 37 mm of thickness.

The following table shows the multiplication factor for each individual thickness in the product family. In order to determine the environmental impacts associated with a determinate product thickness, the results indicated in this EPD must be multiplies by the corresponding multiplication factor. To obtain this factor, a conservative principle has been followed, being the real impact of the product slightly lower than the indicated in the table.

| PRODUCT THICKNESS (MM) | MULTIPLICATION FACTOR |
|---|---|
| 30 | 0,84 |
| 36 | 1 |
| 40 | 1,11 |
| 50 | 1,39 |
| 60 | 1,67 |
| 70 | 1,94 |
| 80 | 2,22 |
| 90 | 2,50 |
| 100 | 2,78 |
| 120 | 3,33 |
| 140 | 3,89 |
| 160 | 4,46 |
| 180 | 5,00 |
| 200 | 5,54 |
| 220 | 6,13 |

# Bibliography

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- UNE-EN 15804:2012+A1:2013: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
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