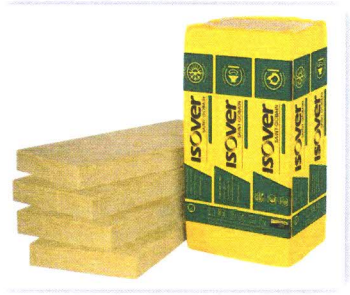
ENVIRONMENTAL PRODUCT DECLARATION

Environmentální prohlášení o produktu

In accordance with (v souladu s) EN 15804 and ISO 14025

Isover UNI / AKU



Declaration owner: *Výrobce:*	Saint-Gobain Construction Products CZ a.s., Isover division
EPD Programme: *Pravidla značení:*	Národní program environmentálního značení
Declaration number : *Registrační číslo:*	3013EPD-15-0392
Issued: *Datum vydání:*	3. 11. 2015
Valid to: *Platné do:*	3. 11. 2020

EPD VERIFIED

The environmental impacts of this product have been assessed over its whole life cycle. Its Environmental Product Declaration has been verified by an independent third party.

ISOVER SAINT-GOBAIN

Verified EPD by Independent Third Party Accredited Certification Body
Building Research Institute - Certification Company Ltd.
Czech Republic, Prazska 810/16, 102 21 Praha 10 info@vups.cz www.vups.cz

General information

Manufacturer: Saint-Gobain Construction Products CZ a.s., Isover division
Počernická 272/96, 108 03 Prague 10, Czech Republic
VAT CZ25029673

About company: International company, enterprising in 64 countries, part of Saint-Gobain group, more than 190 000 employees. Subject of enterprise of Isover division is to produce and sell thermal insulation from mineral wool, expanded and extruded polystyrene, their accessories and providing technical support for marketed solutions.

Product name and manufacturer represented: Isover UNI / AKU;
Saint-Gobain Construction Products CZ a.s, Isover division
Factory address: Masarykova 197, 517 50 Častolovice, Czech Republic

Harmonised Commodity Code: 68069000

EPD Programme:	Národní program environmentálního značení
Registration no:	3013EPD-15-0392
Date of publication:	3. 11. 2015
EPD validity:	3. 11. 2020
EPD valid within the following geographical area:	National
Generic PCR review conducted by:	EN 15804
Information for the Environmental Product Declaration based on:	General report on isover LCA Castolovice, Paris, France: Isover, 2015
Independent external verification of the declaration and data, according to ISO 14025:	Third party verification: Mgr. Barbora Vlasatá, Certification body for EPD, Výzkumný ústav pozemních staveb – Certifikační společnost, s.r.o., Praha, Czech Republic
Accredited or approved by	ČIA, Czech Accreditation Institute.

EPD calculation has been done in Ecobilan software TEAM, version 5.1. by:

Ing. Petr Vacek
Saint-Gobain Construction Products CZ a.s.,
Isover division, Czech Republic

ISOVER SAINT-GOBAIN
Saint-Gobain Construction Products CZ a.s.
divize Isover
Počernická 272/96, 108 03 Praha 10
DIČ/VAT: CZ25029673

Independant verification of calculation data and other environmental information:

Mgr. Barbora Vlasatá
Výzkumný ústav pozemních staveb, Certifikační společnost, s.r.o. Praha, Czech Republic

CERTIFIKAČNÍ ORGÁN PRO EPD VÚPS Certifikační společnost Výzkumný ústav pozemních staveb

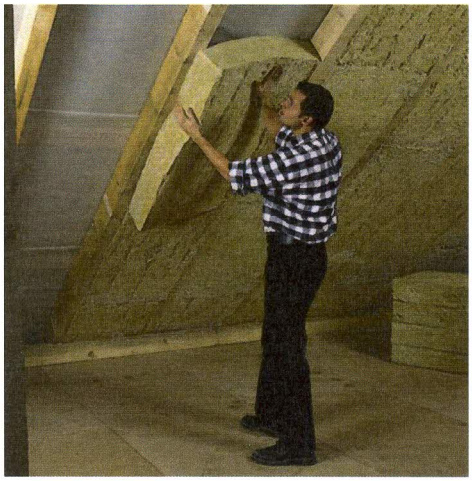
Product description

Product description and description of use:

This EPD describes the environmental impacts of 1 m² of mineral wool product. EPD was created from complete data included all thicknesses of the product. Each thickness influents environmental impacts specifically, their individual impacts were taken into account by the real production and sale rate. Thickness proportions are listed thereinafter.

Production process of this mineral wool uses natural and abundant raw materials (volcanic rock), blast-furnace slag, recycled contend (briquettes), fusion and fiberising techniques to produce stone wool. The products obtained come in the form of a "mineral wool mat" consisting of a soft, airy structure. It is made of hydrophilic mineral wool, so it has special parameters unlike to standard mineral wool. (see *Manufacturing process flow diagram on page 6*)

Isover UNI (Isover AKU) slabs are suitable for unloaded insulations of the outer walls (ventilated facades under the cladding with insulant inserted into cassettes or frames), insulation of the pitch roofs, ceilings, false ceilings and other light sandwich constructions. Product Isover AKU is a special form of Isover UNI (same density, mechanical properties, thermal, acoustic and fire properties) but with slightly different dimensions, adjusted to gypsum plasterboard profiles. The primar use of Isover AKU are these partition walls.
Dimensions of Isover UNI: 1200 x 600 mm
Dimensions of Isover AKU: 1000 x 625 mm
Both materials is suitable for fire protection partition walls where the density ≥ 40 kg.m^{-3} is required.



Example of use Isover UNI

Example of use Isover AKU

Product parameters for EPD calculation:

PARAMETER	VALUE
Thickness of product	100 mm (from range 40 -200 mm)
Density	40 kg. m^3 (constant for all thicknesses)
Recycled briquette content	33,4 %
Surfacing	None
Packaging for the distribution and transportation	Polyethylene: 4,4 g/m² (free parcels)
Quantity by transport (truck)	4320 kg
Distance transport (by truck) od the final product	120 km
Product used for the Installation:	None
Implementation loss rate	0,05 %

Technical data / physical characterictics:

PARAMETER	VALUE
Thermal resistance (100 mm) (EN 12162)	2,85 $K.m^2.W^{-1}$
Thermal conductivity coefficient λ_D (EN 12667)	0,035 $W.m^{-1}.K^{-1}$
Water vapour transmission (EN 12086)	1 [-]
Compressive strength (EN 826)	Not declared
Tensile strength (EN 1607)	Not declared
Reaction to fire class (EN 13 501-1)	A1

More info: http://www.isover.cz/en/declaration-of-performance

Chemical and hazard information:

Substance	C.A.S. number(2)	Amount weight (%)	Classification and labelling (Regulation (CE) n°1272/2008)	Classification and labelling (European directive 67/548/EEC)(4)
Stone wool (1)		over 95 %	Not classified (3)	Not classified
Terpolymerbinder		5%	Not classified	Not classified

(1): Man-made vitreous (silicate) fibres with random orientation with alkaline oxide and alkali earth oxide (Na2O+K2O+CaO+MgO+BaO) content greater than 18% by weight and fulfilling one of the nota Q conditions

(2): C.A.S. : Chemical Abstract Service

(3): Non classified H351 "suspected of causing cancer". Stone fibres are not classified carcinogenic according to the note Q of the Directive 97/69/EEC and the regulation n° 1272/2008 (page 335 of the JOCE L353 of December 31, 2008)

(4): Where substances are classified in accordance with Regulation (EC) No 1272/2008 during the period from its entry into force until 1 December 2010, that classification may be added in the safety data sheet together with the classification in accordance with Directive 67/548/EEC. From 1 December 2010 until 1 June 2015, the safety data sheets for substances shall contain the classification

More info: http://www.isover.cz/en/safety-documents

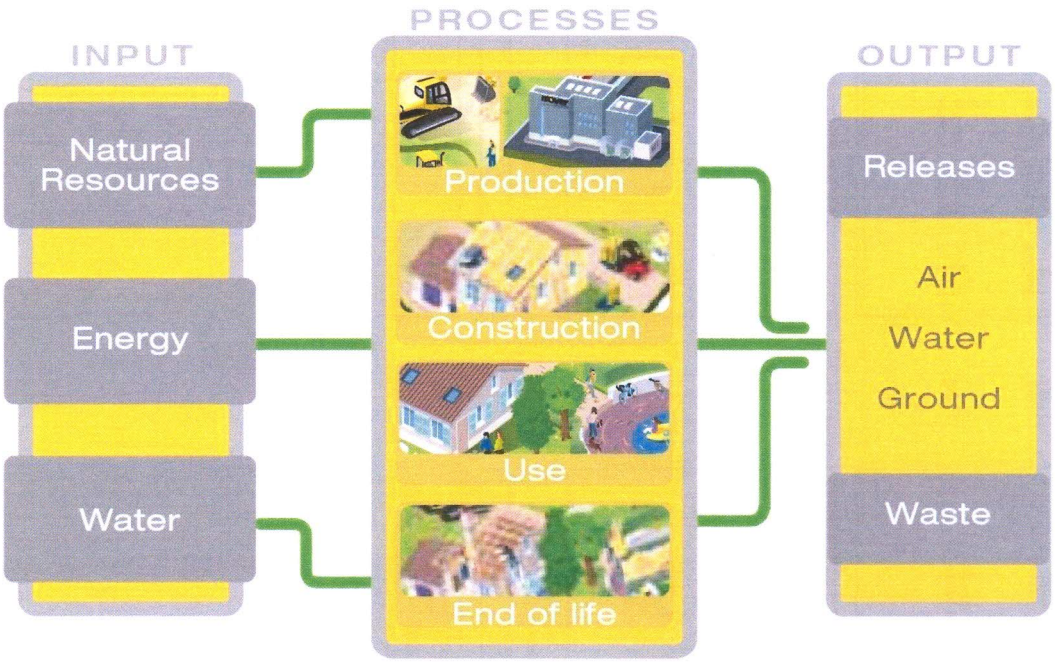
Most important hazards: There is no Hazard statement associated with this product

Material doesn´t content any of substances listed in the "Candidate List of Substances of Very High Concern for authorisation

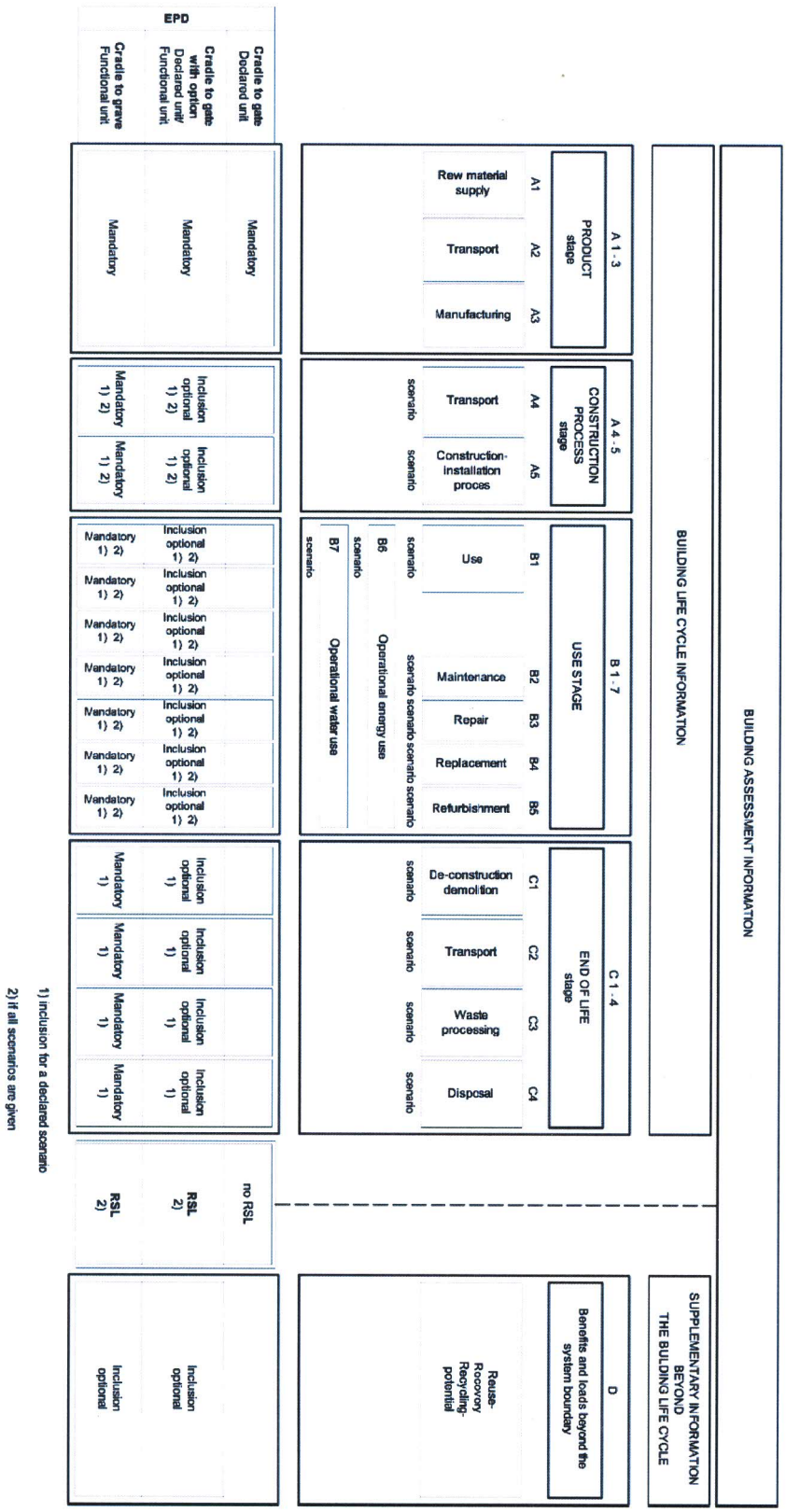
LCA calculation information

FUNCTIONAL UNIT	Providing a thermal insulation on 1 m² with a thermal resistance of 2,85 $K.m^2.W^{-1}$
SYSTEM BOUNDARIES	Cradle to Grave: Mandatory stages = A1-3, A4-5, B1-7, C1-4 and Optional stage = D
REFERENCE SERVICE LIFE (RSL)	50 years
CUT-OFF RULES	The use of cut-off criterion on mass inputs and primary energy at the unit process level (1%) and at the information module level (5%); Flows related to human activities such as employee transport are excluded; The construction of plants, production of machines and transportation systems is 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; Product parts, that are neglectable for its small influence, are for example Paper Labels, used for labelling insulation parcels and pallets.
ALLOCATIONS	Allocation criteria are based on mass
GEOGRAPHICAL COVERAGE AND TIME PERIOD	Czech Republic 2013

According to EN 15804, EPD of construction products may not be comparable if they do not comply with this standard. According to ISO 21930, EPD might not be comparable if they are from different programmes.



Life cycle stages



1) inclusion for a declared scenario

2) if all scenarios are given

Product stage, A1-A3

Description of the stage:

The product stage of the mineral 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 scenarios and additional technical information:

A1, Raw material 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 binder components and sourcing (quarry) of raw materials for fibre production, e.g. basalt and slag for stone wool. Besides these raw materials, recycled materials (briquettes) are also used as input. See detailed info at the end of this EPD.

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

A3, manufacturing
This module includes process taking place on the manufacturing site. Specifically, it covers stone wool fabrication including melting and fiberization see process flow diagram and packaging.
The production of packaging material is taking into account at this stage.

Manufacturing process schema

Construction process stage, A4-A5

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

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
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat, etc.	Average truck trailer with a 24t payload, diesel consumption 38 litres for 100 km
Distance	120 km (for further distances could be A4 criteria linearly adjusted)
Capacity utilisation (including empty returns)	95 % of the capacity in volume 30 % of empty returns
Bulk density of transported products	40 kg/m^3
Volume capacity utilisation factor	1 (by default)

A5, Installation in the building: This module includes

- Wastage of products: see following table 5 %. These losses are landfilled (landfill model for stone wool see chapter end of life),
- Additional production processes to compensate for the loss,
- Processing of packaging wastes: they are 100 % collected and modelled as recovered matter.

PARAMETER	VALUE
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	5 %
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 modelled as recovered matter 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 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 mineral wool insulation products have no impact (excluding potential energy savings) on this stage.

End-of-life stage C1-C4*

Description of the stage:

The stage includes the different modules of end-of-life detailed below.

C1, de-construction, demolition
The de-construction and/or dismantling of insolation 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 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 scenarios and additional technical information: See below
End-of-life:

PARAMETER	VALUE/DESCRIPTION
Collection process specified by type	4 kg (collected with mixed construction waste)
Recovery system specified by type	No re-use, recycling or energy recovery
Disposal specified by type	4 kg g are landfilled
Assumptions for scenario development (e.g. transportation)	Average truck trailer with a 24 t payload, diesel consumption 38 litres for 100 km 25 km

Reuse/recovery/recycling potential, D*

Description of the stage: Packaging wastes from module A5 are reported in this module as recovered matter for information...

*see Environmental positive contribution at the end of EPD

LCA results

LCA model, aggregation of data and environmental impact are calculated from the TEAM™ software 5.1.

Resume of the LCA results detailed on the following tabs.

Environmental impacts of other thicknesses can be recounted by the design factor (on the material density and thickness base):

thickness (mm)	40	50	60	80	100	120	140	160	180	200
factor	0,4	0,5	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0

ENVIRONMENTAL IMPACTS

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	
Global Warming Potential (GWP) - *kg CO2 equiv/FU*	9,4E+00	1,5E-01	4,8E-01	0	0	0	0	0	0	0	0	2,7E-02	0	0	0
	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*	3,0E-07	1,0E-07	2,0E-08	0	0	0	0	0	0	0	0	1,9E-08	0	0	0
	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*	6,0E-02	8,7E-04	3,1E-03	0	0	0	0	0	0	0	0	1,6E-04	0	0	0
	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*	3,6E-03	2,1E-04	1,9E-04	0	0	0	0	0	0	0	0	4,1E-05	0	1,9E-05	0
	Excessive enrichment of waters and continental surfaces with nutrients, and the associated adverse biological effects.														
Photochemical ozone creation (POPC) *Ethene equiv/FU*	3,2E-03	2,0E-05	1,6E-04	0	0	0	0	0	0	0	0	3,7E-06	0	0	0
	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 ressources (ADP-elements) - *kg Sb equiv/FU*	1,5E-06	2,1E-11	7,4E-08	0	0	0	0	0	0	0	0	4,0E-12	0	0	0
Abiotic depletion potential for fossil ressources (ADP-fossil fuels) - *MJ/FU*	1,5E+02	1,8E+00	7,5E+00	0	0	0	0	0	0	0	0	3,4E-01	0	0	0
	Consumption of non-renewable resources, thereby lowering their availability for future generations.														

RESOURCE USE

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*	1,9E+00	1,0E-03	9,5E-02	0	0	0	0	0	0	0	0	1,9E-04	0	0	0
Use of renewable primary energy used as raw materials *MJ/FU*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) *MJ/FU*	1,9E+00	1,0E-03	9,5E-02	0	0	0	0	0	0	0	0	1,9E-04	0	0	0
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - *MJ/FU*	1,3E+02	1,8E+00	6,5E+00	0	0	0	0	0	0	0	0	3,4E-01	0	0	0
Use of non-renewable primary energy used as raw materials *MJ/FU*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total use of non-renewable primary energy resources (primary energy energy resources used as raw materials) - MJ/FU and primary	1,3E+02	1,8E+00	6,5E+00	0	0	0	0	0	0	0	0	3,4E-01	0	0	0
Use of secondary material *kg/FU*	3,4E+00	0	1,7E-01	0	0	0	0	0	0	0	0	0	0	0	2,3E-02
Use of renewable secondary fuels- *MJ/FU*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Use of non-renewable secondary fuels - *MJ/FU*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Use of net fresh water - *m3/FU*	3,1E-02	1,7E-04	1,6E-03	0	0	0	0	0	0	0	0	3,2E-05	0	0	0

WASTE CATEGORIES

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	
Hazardous waste disposed *kg/FU*	1,7E-03	4,1E-05	8,5E-05	0	0	0	0	0	0	0	0	7,8E-06	0	0	0
Non-hazardous waste disposed *kg/FU*	1,7E+00	1,5E-04	5,7E-01	0	0	0	0	0	0	0	0	2,9E-05	0	4,8E+00	0
Radioactive waste disposed *kg/FU*	1,6E-04	2,9E-05	9,7E-06	0	0	0	0	0	0	0	0	5,5E-06	0	0	0

OUTPUT FLOWS

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	
Components for re-use *kg/FU*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Materials for recycling *kg/FU*	4,2E+00	7,2E-07	2,3E-01	0	0	0	0	0	0	0	0	1,4E-07	0	0	0
Materials for energy recovery *kg/FU*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exported energy *MJ/FU*	6,7E-03	0	3,3E-04	0	0	0	0	0	0	0	0	0	0	0	0

LCA interpretation

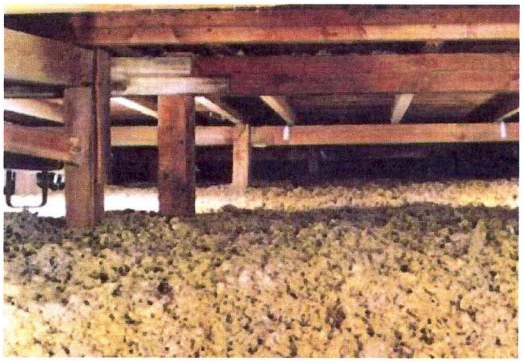
[1] This indicator corresponds to the abiotic depletion potential of fossil resources. *Potenciál úbytku nerostných surovin.*
[2] This indicator corresponds to the total use of primary energy. *Spotřeba primární energie.*
[3] This indicator corresponds to the use of net fresh water. *Spotřeba vody.*
[4] This indicator corresponds to the sum of hazardous, non-hazardous and radioactive waste disposed. *Tvorba odpadu klasifikovaného jako bezpečný, nebezpečný a radioaktivní.*

*Environmental positive contribution

Waste processing for reuse, recovery and/or recycling (not considered in the LCA scenarios of this EPD):

Factory mineral wool waste can be processed into recycled briquettes for mineral wool production. Only internal recycled products (that never leave factory gate) can be used as a production input and it is mentioned only at **part A1** - Raw material supply. Main parts of these briquettes are Milled wet mineral waste, Cement and Bauxit.

Second way how to reuse or recycle old mineral wool waste is to mill it and use it as a blown wool for attic floor insulation or for cavity constructions. This option is now available only for an internal waste recycling (for products, that have never been used in real constructions). That's why this reuse and recycling is not counted also for stages C and D of this EPD.



Additional information

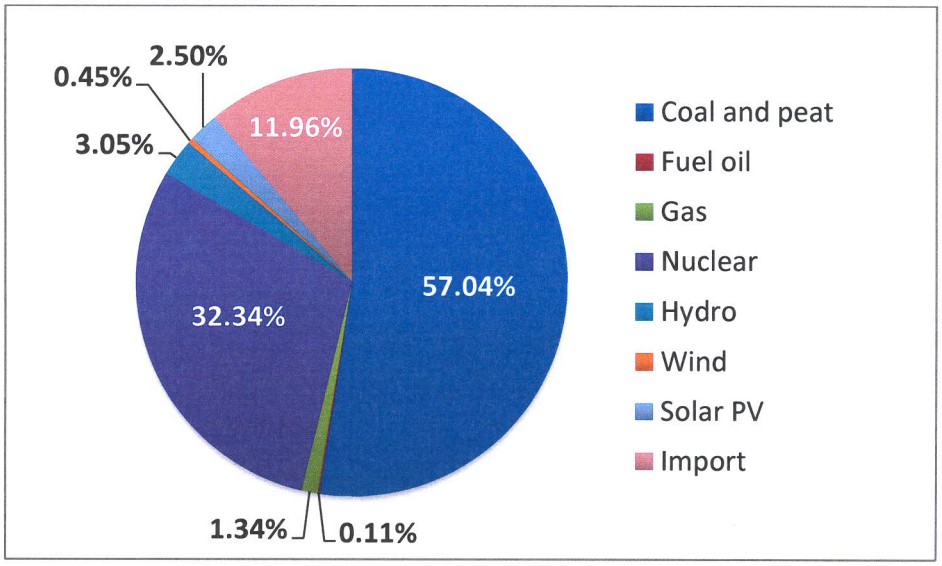
Production process follows in addition these international standards:

ČSN EN ISO 9001: 2009
ČSN EN ISO 14001: 2005

Additional information

The electricity production model considered for the modelling of Saint-Gobain plant is:
401 Electricity (Czech Republic, 2011)

TYPE OF INFORMATION	DESCRIPTION
Location	Representative of average production in Czech Republic (2011)
Geographical representativeness description	Breakdown of energy sources in Czech Republic (source: IEA 2011):-: Coal and peat: 57.04%- Fuel oil: 0.11%- Gas: 1.34%- Nuclear: 32.34%- Hydro: 3.05%- Tide: 0.00%- Wind: 0.45%- Solar PV: 2.50%- Other non-thermal: 0.00%Import: 11.96%
Reference year	2011
Type of data set	Cradle to gate
Source	IEA 2011



References

[1] ČSN EN 15804. Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products. Prague: Úřad pro technickou normalizaci, metrologii a státní zkušebnictví, 2012

[2] ČSN ISO 14025. Environmental labels and declarations - Type III environmental declarations - Principles and procedures. Prague: ČESKÝ NORMALIZAČNÍ INSTITUT, 2006

[3] General report on isover LCA Castolovice. Paris, France: Isover, 2015

[4] Pravidla Ministerstva životního prostředí k realizaci Národního programu environmentálního značení, 2007