

ENVIRONMENTAL PRODUCT DECLARATION

Environmentální prohlášení o produktu

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

Isover T-N / T-P

| | |
|--|---|
| Declaration owner: <i>Výrobce:</i> | Saint-Gobain Construction Products CZ a.s., Isover division |
| EPD Programme: <i>Pravidla značení:</i> | Národní program environmentálního značení |
| Declaration number : <i>Registrační číslo:</i> | 3013EPD-15-0398 |
| Issued: <i>Datum vydání:</i> | 3. 11. 2015 |
| Valid to: <i>Platné do:</i> | 3. 11. 2020 |



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.



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

ISOVER
SAINT-GOBAIN

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 T-N / T-P;
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 number: | 3013EPD-15-0398 |
| 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
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divize Isover
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DIČ/MAT: 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



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 influences environmental impacts specifically, their individual impacts were taken into account by the real production and sale rate. Thickness proportions are listed thereafter.

Production process of this mineral wool uses natural and abundant raw materials (volcanic rock), blast-furnace slag, recycled content (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 T-N (Isover T-P) slabs are suitable for improving of impact and airborne sound reduction in floating floors. Product Isover T-P is a special form of Isover T-N (same density, mechanical properties, thermal, acoustic and fire properties) but with slightly improved thickness tolerances, adjusted for use in dry, non-cement compositions.

Isover T-N:

Thickness tolerance classification T6: - 5% or - 1 mm and +15% or + 3 mm, the higher numerical value prevails in both the cases.

Isover T-P:

Thickness tolerance classification T7: 0 mm and + 10%, or + 2 mm, the higher numerical value prevails in both the cases.



Typical use of Isover T-P – below floor slabs – dry process



Typical use of Isover T-N – below anhydrit – wet process



Product parameters for EPD calculation:

| PARAMETER | VALUE |
|--|--|
| Thickness of product | 25 mm (from range 20 - 50 mm) |
| Density | 148 kg. m ³ (constant for all thicknesses) |
| Recycled briquette content | 33,4 % |
| Surfacing | None |
| Packaging for the distribution and transportation | Polyethylene: 25 g/m ² (free parcels) |
| Quantity by transport (truck) | 6394 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 characteristics:

| PARAMETER | VALUE |
|---|--|
| Thermal resistance (25 mm) (EN 12162) | 0,65 K.m ² .W ⁻¹ |
| Thermal conductivity coefficient λ_D (EN 12667) | 0,039 W.m ⁻¹ .K ⁻¹ |
| Water vapour transmission (EN 12086) | 1 [-] |
| Compressive strength (EN 826) | 40 kPa |
| 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

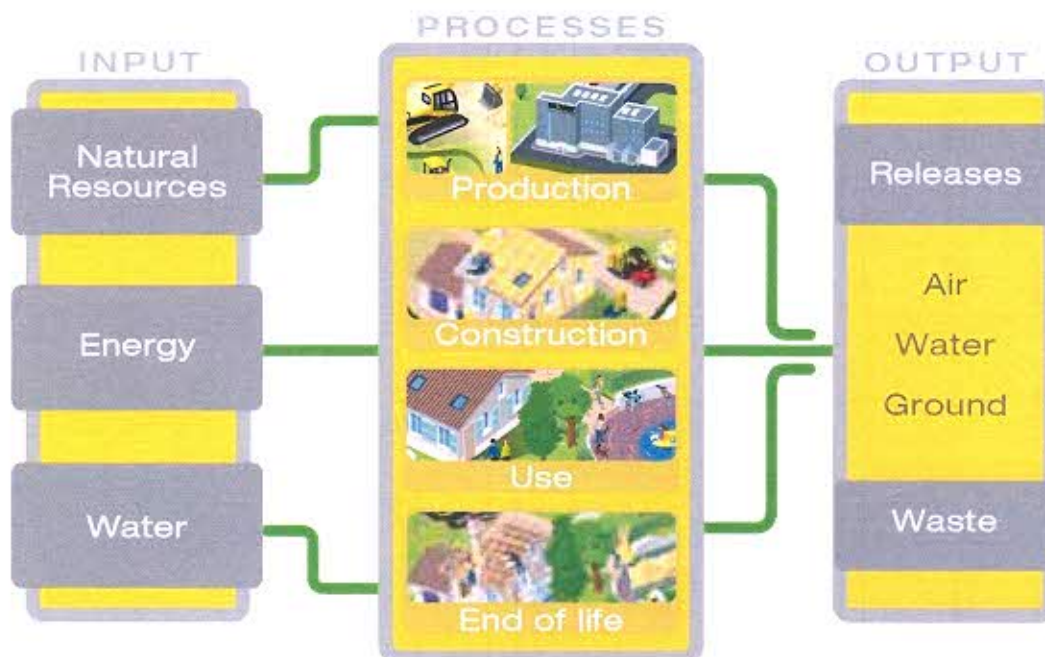
Material doesn't content any of substances listed in the "Candidate List of Substances of Very High Concern for authorisation



LCA calculation information

| | |
|--|---|
| FUNCTIONAL UNIT | Providing a thermal insulation on 1 m ² with a thermal resistance of 0,65 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 | <p>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%);</p> <p>Flows related to human activities such as employee transport are excluded;</p> <p>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;</p> <p>Product parts, that are neglectable for its small influence, are for example Paper Labels, used for labeling insulation parcels and pallets.</p> |
| 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

| | | BUILDING ASSESSMENT INFORMATION | | | | BUILDING LIFE CYCLE INFORMATION | | BUILDING ASSESSMENT INFORMATION | | | | | | | | | | |
|-----|--|---------------------------------|---------------------|-----------|---------------------------------|---------------------------------|--|--|--------------------------|--------------------------|--------|---|--------------------------|--------------------------|-------------------------------------|--------------------------|---------------------------|--------------------------|
| | | | | | | | | SUPPLEMENTARY INFORMATION BEYOND THE BUILDING LIFE CYCLE | | | | | | | | | | |
| EPD | Cradle to gate Declared unit | Mandatory | A 1.3 | | A 4.5 | | B 1.7 | | C 1.4 | | D | Benefits and loads beyond the system boundary | | | | | | |
| | | | PRODUCT stage | | CONSTRUCTION PROCESS stage | | USE STAGE | | END OF LIFE stage | | | | | | | | | |
| | | | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | | | B4 | B5 | C1 | C2 | C3 | C4 |
| | | | Raw material supply | Transport | Manufacturing | Transport scenario | Construction-installation process scenario | Use scenario | Maintenance scenario | Repair scenario | | | Replacement scenario | Refurbishment scenario | De-construction demolition scenario | Transport scenario | Waste processing scenario | Disposal scenario |
| | | | B6 | B7 | Operational energy use scenario | Operational water use scenario | no RSL | RSL 2) | RSL 2) | Inclusion optional | | | Inclusion optional | Inclusion optional | Inclusion optional | Inclusion optional | Inclusion optional | Inclusion optional |
| EPD | Cradle to gate with option Declared unit | Mandatory | A 1.3 | | A 4.5 | | B 1.7 | | C 1.4 | | no RSL | | | | | | | |
| | | | PRODUCT stage | | CONSTRUCTION PROCESS stage | | USE STAGE | | END OF LIFE stage | | | | | | | | | |
| | | | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | | | B4 | B5 | C1 | C2 | C3 | C4 |
| | | | Raw material supply | Transport | Manufacturing | Transport scenario | Construction-installation process scenario | Use scenario | Maintenance scenario | Repair scenario | | | Replacement scenario | Refurbishment scenario | De-construction demolition scenario | Transport scenario | Waste processing scenario | Disposal scenario |
| | | | B6 | B7 | Operational energy use scenario | Operational water use scenario | Inclusion optional 1) 2) | Inclusion optional 1) 2) | Inclusion optional 1) 2) | Inclusion optional 1) 2) | | | Inclusion optional 1) 2) | Inclusion optional 1) 2) | Inclusion optional 1) 2) | Inclusion optional 1) 2) | Inclusion optional 1) 2) | Inclusion optional 1) 2) |
| EPD | Cradle to gate Functional unit | Mandatory | A 1.3 | | A 4.5 | | B 1.7 | | C 1.4 | | RSL 2) | Inclusion optional | | | | | | |
| | | | PRODUCT stage | | CONSTRUCTION PROCESS stage | | USE STAGE | | END OF LIFE stage | | | | | | | | | |
| | | | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | | | B4 | B5 | C1 | C2 | C3 | C4 |
| | | | Raw material supply | Transport | Manufacturing | Transport scenario | Construction-installation process scenario | Use scenario | Maintenance scenario | Repair scenario | | | Replacement scenario | Refurbishment scenario | De-construction demolition scenario | Transport scenario | Waste processing scenario | Disposal scenario |
| | | | B6 | B7 | Operational energy use scenario | Operational water use scenario | Inclusion optional 1) 2) | Inclusion optional 1) 2) | Inclusion optional 1) 2) | Inclusion optional 1) 2) | | | Inclusion optional 1) 2) | Inclusion optional 1) 2) | Inclusion optional 1) 2) | Inclusion optional 1) 2) | Inclusion optional 1) 2) | Inclusion optional 1) 2) |

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 fiber 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 liters 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 | 148 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 modeled 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 modeled 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 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 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 | 3,7 kg (collected with mixed construction waste) |
| Recovery system specified by type | No re-use, recycling or energy recovery |
| Disposal specified by type | 3,7 kg g are landfilled |
| Assumptions for scenario development (e.g. transportation) | Average truck trailer with a 24 t payload, diesel consumption 38 liters 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) | factor |
|----------------|--------|
| 20 | 0,80 |
| 25 | 1,00 |
| 30 | 1,20 |
| 40 | 1,60 |
| 50 | 2,00 |



