ENVIRONMENTAL PRODUCT DECLARATION
as per /ISO 14025/ and /EN 15804/

<table>
<thead>
<tr>
<th>Owner of the Declaration</th>
<th>Evonik Resource Efficiency GmbH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programme holder</td>
<td>Institut Bauen und Umwelt e.V. (IBU)</td>
</tr>
<tr>
<td>Publisher</td>
<td>Institut Bauen und Umwelt e.V. (IBU)</td>
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<tr>
<td>Declaration number</td>
<td>EPD-EVO-20170122-IBA1-EN</td>
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<tr>
<td>ECO EPD Ref. No.</td>
<td>ECO-00000774</td>
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<tr>
<td>Issue date</td>
<td>13.11.2018</td>
</tr>
<tr>
<td>Valid to</td>
<td>12.11.2023</td>
</tr>
</tbody>
</table>

CALOSTAT®
Evonik Resource Efficiency GmbH
1. General Information

Evonik Resource Efficiency GmbH

Programme holder
IBU - Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

 Declaration number
EPD-EVO-20170122-IBA1-EN

This declaration is based on the product category rules:
Mineral insulating materials, 07.2014
(PCR checked and approved by the SVR)

Issue date
13.11.2018

Valid to
12.11.2023

Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)

Dipl. Ing. Hans Peters
(Head of Board IBU)

Dr. Frank Wemer
(Independent verifier appointed by SVR)

2. Product

2.1 Product description / Product definition

CALOSTAT® is a high-performance insulating material based on synthetically amorphous silicon dioxide. From a chemical standpoint, this corresponds to quartz in a non-crystalline structure.

The present EPD describes a mineral insulation board for construction applications, such as facade elements, pre-cast concrete parts, core insulation, pre-wall shells and construction elements such as doors and windows, as well as for the optimization of technical building equipment.

CALOSTAT® boards are self-supporting lightweight construction elements, the essential characteristic features of which are a low heat conductivity (0.02 W / (m*K)) in a wide temperature range, flame-resistance and chemical stability. CALOSTAT® is a non-flammable material which is assigned to building material class A in accordance with DIN 4102. By definition, CALOSTAT® is a super insulation material as it provides better insulation than still air.

The insulating material described here is produced by pressing boards under a high level of pressure. The material is gray and has a raw density of 165 kg/m³. In essence, CALOSTAT® is a water-resistant insulating material, however water vapor can diffuse through the material without destroying its structure or condensing.

Due to its mineral basis, CALOSTAT® can be recycled and behaves in a non-reactive manner with compound materials.

The ordinance (EU) no. 305/2011 (CPR) applies to the marketing of the product in the EU/EFTA (with the exception of Switzerland). The product requires a declaration of performance taking into account the respective national provisions apply when the product is used.
2.2 Application
CALOSTAT® is recommended for different areas of use inside and outside around the building envelope in accordance with DIN 4108-10, for example: Interior insulation of ceilings, roofs, floor panels under floor screed and walls (DI, DEO dg, WI); exterior insulation of roof or ceiling under cover or waterproofing and wall behind covering (DAD, DAA, WAB) as well as core insulation for two-shell masonry for exterior walls. This makes CALOSTAT® a suitable insulating material for use in all building types out of living, industrial, office and administration buildings.

Facade
CALOSTAT® makes it possible to have a particularly narrow facade structure. In this way, facades can be newly built or renovated while complying with the property border, the distance area to neighboring buildings or even while maintaining the available supporting structures. Relevant facade types here are e.g. post-rail facades, hung element facades or narrow facade structure. In this way, facades can be reduced by up to 50% compared to the use of conventional mineral insulating materials. This in turn increases the design options for planners and architects.

Further advantages are that lower wall structures in facade construction mean less structural load and that fewer materials are required, and in prefabricated construction that the transport capacities are increased thanks to the thinner wall structures.

Solid construction
In new buildings, CALOSTAT® is suitable for core insulation in insulating bricks, but also in facing bricks and two-shell masonry or as core insulation in concrete and lightweight prefabricated concrete parts. In restoration work, solid construction houses can be insulated systematically without losing their character.

Interior insulation
As a thermal upgrade of interior insulation, for example in building renovations, it is possible to use CALOSTAT® with mineral building materials e.g. made from calcium silicate, bricks or porous concrete. CALOSTAT® is then applied to the wall in the form of a breathable mineral composite material. This creates a very narrow capillary-active interior insulation which was not previously possible in this form.

Ceiling and floor insulation
As insulation for ceilings and floors, CALOSTAT® makes it possible to retain or create a barrier-free building structure, particularly when performing renovation work in existing buildings. In the case of cavity flooring, CALOSTAT® fulfills the high fire protection requirements.

2.3 Technical Data
The construction data refers to the product CALOSTAT® in accordance with ETA-16/0587.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal conductivity</td>
<td>0.02</td>
<td>W/(mK)</td>
</tr>
<tr>
<td>Water vapour diffusion resistance factor (µ) in accordance with EN 12086:2013</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Gross density in accordance with EN 1602:2013</td>
<td>165 kg/m³</td>
<td></td>
</tr>
<tr>
<td>Water uptake during long-term partial submersion in accordance with EN 12087:2013</td>
<td>≤ 0.1 kg/m²</td>
<td></td>
</tr>
<tr>
<td>Pressure resistance in accordance with EN 826:2013</td>
<td>≥ 90 kPa</td>
<td></td>
</tr>
<tr>
<td>Fire behavior: Class in accordance with EN 13501-1:2010</td>
<td>A2-s1-d0</td>
<td></td>
</tr>
<tr>
<td>Evenness in length and width directions in accordance with EN 825:2013</td>
<td>≤ 2 mm</td>
<td></td>
</tr>
<tr>
<td>Dimension stability at 70°C and 90% rel. humidity in accordance with EN 1604:2013</td>
<td>≤ 0.5 %</td>
<td></td>
</tr>
<tr>
<td>Distortion under a stress level of 20kPa and 80°C in accordance with EN 1605:2013</td>
<td>≤ 5.0 %</td>
<td></td>
</tr>
<tr>
<td>Maximum value of a distortion with a concentrated load of 500 N in accordance with EN 12430:2013</td>
<td>≤ 5 mm</td>
<td></td>
</tr>
</tbody>
</table>

2.4 Delivery status
The standard measurements of CALOSTAT® insulation boards are 1000x600mm with a board thickness of 20mm, 25mm, 30mm, 40mm and 50mm. CALOSTAT® is approved for three-layer installation up to an overall thickness of 150 mm. Other measurements are available on request.

2.5 Base materials / Ancillary materials
CALOSTAT® is a hydrophobic insulating material and is made from synthetically amorphous silica (> 60 M.-%), silicon carbide (9 - 29 M.-%) and textile staple fibers based on silicon dioxide (1 - 10 M.-%).

The insulating material does not contain biocides, flame retardants, bonding agents or materials listed in the candidate list of substances of very high concern for authorization.

2.6 Manufacture
CALOSTAT® is manufactured in accordance with DIN ISO 9001. The quality assurance is ensured by way of internal and external product and production inspections in accordance with the building supervisory authority regulations. The product quality is documented by way of conformity labeling for construction products and the resulting monitoring inspections, as well as test certificates.
2.7 Environment and health during manufacturing

The exhaust gases produced during production are vacuumed and fed into an exhaust gas treatment facility. During normal operation, no solid or liquid waste is generated. Production waste (scrap) is, if possible, returned to the production process. CALOSTAT® is manufactured in accordance with DIN ISO 14001.

2.8 Product processing/Installation

Aside from the low material thickness and the necessary predominantly planar application of force during the transportation of single insulation boards, the handling of CALOSTAT® does not differ from other insulation boards. This means that the material can easily be processed by separating/sawing, drilling and milling. It is suitable for mechanical fastening as well as for adhesion, while taking into account its hydrophobic properties. Further details can be found in chapter 2.2 “Application”.

2.9 Packaging

The manufacturer supplies the insulation boards on wooden pallets. The arrangement of the pallet varies depending on the pallet’s thickness. The boards are protected for transportation in cardboard packaging.

Wooden multi-use pallets are accepted back by the building materials trade (multi-use pallets against reimbursement in the deposit system), these are then returned to the building materials manufacturer and returned to the production process. The cardboard packaging can be fed into the established return system. In other countries, the national regulations should be observed.

2.10 Condition of use

In the utilization phase, vast quantities of energy can be saved when using building components insulated with CALOSTAT® thanks to the significant reduction in transmission heat loss. System components with CALOSTAT® are usually characterized by a very high demand for fire resistance.

The material composition in the utilization phase remains unchanged and corresponds to the raw materials as described in chapter 2.5.

2.11 Environment and health during use

When used properly, no effects on health and the environment should be expected. The safety data sheets are sent with the first delivery or when a version has been revised, or can be downloaded via the website www.calostat.de.

2.12 Reference service life

The disclosure of a reference period of use in accordance with ISO 15686 is not necessary in accordance with EN 15804. The assumptions of a period of use of more than 50 years for CALOSTAT® are based on the current state of knowledge, science and practical experience. The real lifespan of a material, however, depends on environmental and installation conditions as well as from the individual structure, design and use of the component, which can also shorten the lifespan of the building material in unique cases. If CALOSTAT® is installed and used in accordance with the manufacturer’s instructions, the real lifespan can also be longer without notable degradation processes.

2.13 Extraordinary effects

Fire

Insulating materials based on synthetically amorphous silica have been tried and tested for decades in high-temperature insulation scenarios and have been used for a long time in many applications such as in the manufacture of metal and in ovens. With building material class A2-s1-d0 in accordance with DIN EN 13501-1:2010, CALOSTAT® fulfills the highest requirements for a low smoke production and it has no burning parts or parts liable to fall or drip when burning. In addition, CALOSTAT® fulfills the requirements for the test in fire shafts in accordance with DIN 4102-1 and can thus be treated as a building material of classification A of the German test regulations.

<table>
<thead>
<tr>
<th>Fire safety</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building material class</td>
<td>A2</td>
</tr>
<tr>
<td>Burning droplets</td>
<td>d0 (no dripping / falling)</td>
</tr>
<tr>
<td>Smoke gas development</td>
<td>s1 (no / little smoke production)</td>
</tr>
</tbody>
</table>

Water

CALOSTAT® is vapor diffusive and therefore supports the regulation of moisture. When in contact with water, it retains its shape and is hydrophobic, making it impermeable for liquid water. These qualities and a purely mineral material composition helps buildings and living areas to consistently avoid the formation of mold from the very beginning.

Mechanical destruction

The mechanical destruction of CALOSTAT® does not result in the production of decomposition products which are harmful to the environment or to health.

2.14 Re-use phase

CALOSTAT® insulating materials can be crushed and returned to the production cycle, provided they remain pure of other materials.

2.15 Disposal

While observing the necessary technical regulations after prior arrangement with the disposal company and the responsible authority, CALOSTAT® can be disposed of with waste code number 170604.

If no longer pure, CALOSTAT® can be disposed of in smaller concentrations with general construction waste. As this relates to pure mineral material, this bears the waste code number 170107.

2.16 Further information

The customer can find more information in the safety data sheet which will be sent with the first delivery, or when an updated version is produced. The safety data sheets can be downloaded from the Website www.calostat.de.
3. LCA: Calculation rules

3.1 Declared Unit
All details relate to a cubic meter of CALOSTAT® with a raw density of 165 kg/m³.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declared unit</td>
<td>1</td>
<td>m³</td>
</tr>
<tr>
<td>Gross density</td>
<td>165</td>
<td>kg/m³</td>
</tr>
<tr>
<td>Conversion factor to 1 kg</td>
<td>0.00606</td>
<td></td>
</tr>
</tbody>
</table>

3.2 System boundary
This EPD type is “From the cradle to the factory gate - with options”. Here, the environmental assessment takes into account the following life-cycle phases:

- Manufacture and preparation of the preliminary products (module A1),
- Transportation of the preliminary products to the factory (module A2),
- Production of CALOSTAT® including the preparation of a waste material for secondary raw material within production, manufacture of the packaging, preparing the energy and production processes (module A3),
- Burning the packaging (module A5),
- Transportation to the recycling process or to landfill (module C2),
- Exhaust air and waste treatment (module C3),
- Removal of the used insulation boards (module C4),
- End of life phase (recycling) of used insulation boards (module D).

The raw materials are examined to their elementary flows. The complete production process is examined.

3.3 Estimates and assumptions
For the transportation of the raw and intermediate products, transport via truck is assumed and a corresponding dataset from the GaBi 7 database is used. For unknown transportation distances of raw and residual materials, 500 km is used as a basis.

3.4 Cut-off criteria
In this study, all raw materials, if known, are included. The construction of production plants and the required infrastructure for transportation are not considered. The development expense for the product and input and output streams for administration are also not considered. This is based on the assumption that these expenses to set up and maintain the infrastructure and administration do not exceed a total of 5% of the overall expenses.

3.5 Background data
As background data, data from the GaBi 7 database from thinkstep is used /GaBi 7/.

3.6 Data quality
The data quality of Evonik’s own preliminary products and the actual CALOSTAT® manufacturing process can be highly regarded as this is based on representative or real measured operational data. Expenses for individual production stages for which no measurement data is available were estimated on the basis of Evonik’s own reference processes. The quality of the used GaBi 7 database modules can be taken from the respective documentation.

3.7 Period under review
The data is based on production data from 2017. The background data was brought up to date (2018) at the time of modeling.

3.8 Allocation
The ecological advantages in recovering used CALOSTAT® boards is considered in module D.

3.9 Comparability
Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

In this case, a surface-based consideration was selected with the same insulation performance. The background database used comes from thinkstep (GaBi 7).

4. LCA: Scenarios and additional technical information

The following technical information is the basis for the declared modules and can be used for the development of specific scenarios in the context of a building evaluation.

Installation in the building (A5)
CALOSTAT® is packed into corrugated cardboard boxes and delivered to the user. The disposal of this packaging (burning) is already taken into account in module 5.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other resources</td>
<td>0.25</td>
<td>kg</td>
</tr>
</tbody>
</table>

Utilization (B1) see chapter 2.12 Utilization
As the areas of use and application of CALOSTAT® are very heterogeneous, no uniform scenarios for the utilization phase can be defined in concrete terms.

Reference period of use
According to the manufacturer, the period of use of CALOSTAT® is more than 50 years, provided no mechanical destruction takes place (see chapter 2.12).
### End of the life (C2, C3 and C4)

The following end-of-life scenarios were taken into account:

**Scenario I: 100% to material recycling facility**
It is assumed that the insulation boards remain pure in sort. Expenses for the recycling of CALOSTAT® are taken into account under energy expenses for treatment and transportation. The material can be used as a support core for vacuum insulation panels and thus replace part of the primary raw material, such as silica and silicon carbide.

**Scenario II: 100% to landfill**
After the utilization phase, the entire quantity of CALOSTAT® is taken to landfill.

For both scenarios, transportation from the place of use to the disposal or recycling site is assumed to have a distance of 500 km (module C2).

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recycling Scenario I</td>
<td>165</td>
<td>kg</td>
</tr>
<tr>
<td>Landfilling Scenario II</td>
<td>165</td>
<td>kg</td>
</tr>
</tbody>
</table>

**Re-use, return and recycling potential (D)**
Module D contains credits for the material recycling of CALOSTAT® and thus the saving on primary raw materials.
5. LCA: Results

Detailed below are the environmental effects and balance indicators for 1 m³ CALOSTAT®. Two possible disposal scenarios are identified. Scenario I, as seen in modules C3 and D, based on complete material recycling of CALOSTAT® after the utilization phase. Scenario II (module C4) refers to taking the complete CALOSTAT® quantity to landfill. The transportation of CALOSTAT® after the utilization phase (module C2) applies to both scenarios.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

<table>
<thead>
<tr>
<th>PRODUCT STAGE</th>
<th>CONSTRUCTION PROCESS STAGE</th>
<th>USE STAGE</th>
<th>END OF LIFE STAGE</th>
<th>BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw material supply</td>
<td>Transport</td>
<td>Manufacturing</td>
<td>Transport from the gate to the site</td>
<td>Assembly</td>
</tr>
<tr>
<td>A1</td>
<td>X</td>
<td>X</td>
<td>MND</td>
<td>X</td>
</tr>
</tbody>
</table>

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m³ CALOSTAT®

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1-A3</th>
<th>A5</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global warming potential</td>
<td>kg CO₂-Eq.</td>
<td>6.24E+2</td>
<td>1.81E-1</td>
<td>4.28E+0</td>
<td>1.68E-1</td>
<td>2.67E+0</td>
<td>-4.07E+2</td>
</tr>
<tr>
<td>Depletion potential of the stratospheric ozone layer</td>
<td>kg CFC11-Eq.</td>
<td>1.35E-5</td>
<td>-1.07E-8</td>
<td>1.01E-3</td>
<td>2.42E-3</td>
<td>5.99E-3</td>
<td>-2.81E-6</td>
</tr>
<tr>
<td>Acidification potential of land and water</td>
<td>kg SO₂-Eq.</td>
<td>1.43E+0</td>
<td>-6.51E-4</td>
<td>1.90E+2</td>
<td>2.51E-2</td>
<td>1.56E-2</td>
<td>-2.81E-6</td>
</tr>
<tr>
<td>Eutrophication potential</td>
<td>kg PO₄-Eq.</td>
<td>4.54E-1</td>
<td>-1.67E-5</td>
<td>4.02E-3</td>
<td>4.08E-5</td>
<td>2.19E-3</td>
<td>-3.80E-1</td>
</tr>
<tr>
<td>Formation potential of tropospheric ozone photochemical oxidants</td>
<td>kg ethene-Eq.</td>
<td>1.38E+1</td>
<td>-3.48E-5</td>
<td>-7.21E-3</td>
<td>1.66E+5</td>
<td>1.21E-3</td>
<td>-1.17E-1</td>
</tr>
<tr>
<td>Abiotic depletion potential for non-fossil resources</td>
<td>kg Sb-Eq.</td>
<td>1.21E-3</td>
<td>-8.23E-8</td>
<td>5.04E-7</td>
<td>1.12E-7</td>
<td>9.88E-7</td>
<td>-1.04E-3</td>
</tr>
<tr>
<td>Abiotic depletion potential for fossil resources</td>
<td>M³</td>
<td>8.05E+3</td>
<td>-1.16E+0</td>
<td>6.46E+1</td>
<td>1.60E+0</td>
<td>3.39E+1</td>
<td>-4.72E+3</td>
</tr>
</tbody>
</table>

RESULTS OF THE LCA - RESOURCE USE: 1 m³ CALOSTAT®

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1-A3</th>
<th>A5</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable primary energy as energy carrier</td>
<td>Mj</td>
<td>9.88E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>-9.88E+0</td>
</tr>
<tr>
<td>Non-renewable primary energy resources</td>
<td>Mj</td>
<td>9.30E+2</td>
<td>-4.95E-2</td>
<td>1.54E+0</td>
<td>8.84E-2</td>
<td>9.47E-1</td>
<td>-1.52E+2</td>
</tr>
<tr>
<td>Total use of non-renewable primary energy resources</td>
<td>Mj</td>
<td>2.39E+2</td>
<td>-4.95E-2</td>
<td>1.54E+0</td>
<td>8.84E-2</td>
<td>9.47E-1</td>
<td>-1.52E+2</td>
</tr>
<tr>
<td>Total use of non-renewable primary energy resources</td>
<td>Mj</td>
<td>2.39E+2</td>
<td>-4.95E-2</td>
<td>1.54E+0</td>
<td>8.84E-2</td>
<td>9.47E-1</td>
<td>-1.52E+2</td>
</tr>
<tr>
<td>Use of secondary material</td>
<td>Mj</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
</tr>
<tr>
<td>Use of renewable secondary fuels</td>
<td>Mj</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
</tr>
<tr>
<td>Use of non-renewable secondary fuels</td>
<td>Mj</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
</tr>
<tr>
<td>Use of net fresh water</td>
<td>m³</td>
<td>2.15E+2</td>
<td>7.52E+2</td>
<td>5.09E+3</td>
<td>6.33E+3</td>
<td>6.73E+3</td>
<td>-1.32E+3</td>
</tr>
</tbody>
</table>

RESULTS OF THE LCA - OUTPUT FLOWS AND WASTE CATEGORIES: 1 m³ CALOSTAT®

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1-A3</th>
<th>A5</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous waste disposed</td>
<td>kg</td>
<td>8.87E-6</td>
<td>0.00E+0</td>
<td>4.15E-6</td>
<td>1.02E-9</td>
<td>6.06E-7</td>
<td>-2.05E-6</td>
</tr>
<tr>
<td>Non-hazardous waste disposed</td>
<td>kg</td>
<td>8.10E+0</td>
<td>-2.21E+4</td>
<td>4.83E-3</td>
<td>2.19E-3</td>
<td>1.66E+2</td>
<td>-1.89E+0</td>
</tr>
<tr>
<td>Components for re-use</td>
<td>kg</td>
<td>1.01E-4</td>
<td>-1.33E-4</td>
<td>7.52E-5</td>
<td>2.10E-4</td>
<td>5.10E-4</td>
<td>-1.21E-1</td>
</tr>
<tr>
<td>Materials for recycling</td>
<td>kg</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>1.58E+2</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
</tr>
<tr>
<td>Materials for energy recovery</td>
<td>kg</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
</tr>
<tr>
<td>Exported electrical energy</td>
<td>Mj</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
</tr>
<tr>
<td>Exported thermal energy</td>
<td>Mj</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
</tr>
</tbody>
</table>

6. LCA: Interpretation

The majority of the calculated environmental effects are represented by the manufacture of the raw materials used (upstream chain/ecological rucksack). This also reflects the relationship of the life cycle inventory to the life cycle impact. Transportation and the manufacture of packaging play a subordinate role as opposed to the used energy required. The gate-to-gate environmental effects, meaning during the manufacture of CALOSTAT®, primarily result from the provision of energy after the provision of raw materials. The expenses and emissions during the manufacture phase can be partially balanced out again with recycling (scenario II), made necessary by the high influence of silica manufacture.
7. Requisite evidence

7.1 Biopersistence
The used fibers are not respirable corresponding to the details in the safety data sheets of the manufacturer (no WHO fibers). These are textile staple fibers which are continually pill from the melt and then cut. They have an amorphous solid body structure as well as a uniform fiber diameter of >7.5 µm.

7.2 Radioactivity
CALOSTAT® is not radioactive, according to a measurement of the nuclide content in Bq/kg for Ra-226, Th-232, K-40 (evidence given by a recognized testing body). Evidence was given by means of a gamma spectrometric measurement in accordance with DIN ISO 11929.

7.3 Leaching
The examination of CALOSTAT® by a recognized testing body on 16 October 2017 returned the following findings. For the examination, the sediment sample was eluted with distilled water and then filtered and measured using a membrane filter with a pore width of 0.45 µm in accordance with DIN EN 12457-4.

Results:
Dissolved org. carbon: 54 mg/L
Arsenic: < 0.005 mg/L
Lead: < 0.005 mg/L
Cadmium: < 0.0005 mg/L
Chrome overall: < 0.005 mg/L
Copper: 0.008 mg/L
Nickel: 0.010 mg/L
Mercury: < 0.0001 mg/L
Zinc: < 0.02 mg/L
Selenium: < 0.005 mg/L
Antimony: < 0.005 mg/L
Barium: < 0.005 mg/L
Molybdenum: < 0.005 mg/L
pH value: 7.4
Conductivity: 25.3 µS/cm
Sulfate: 2.28 mg/L
Chloride: 1.6 mg/L
Cyanide (easily released): < 0.002 mg/L
Phenol Index: < 0.005 mg/L
Overall content of dissolved materials: 0.02 mg/L.

7.4 Formaldehyde and VOC emissions
According to rest report no. 51786-001 by a recognized testing laboratory from 23 January 2017, CALOSTAT® meets the requirements of the AgBB scheme 2015.

8. References

Product Category Rules for Building-Related Products and Services
Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report
Product Category Rules for Building-Related Products and Services
AgBB evaluation scheme for VOCs from construction products
Policy for health evaluations of emissions of volatile organic compounds (VVOCC, VOC and SVOC) from construction products, version 2015.

ETA No. 16/0587

GaBi 7
Software and database for integral balancing thinkstep.

DIN 4108-10:2015-12

DIN EN 15804:2014-07: Sustainability of construction works - Environmental product declarations - Core rules for the product category construction product; German version EN 15804:2012+A1:2013

DIN EN 13501-1:2010
EN 13501-1:2010, Classification of Building Products and Constructions according to their Fire Behavior - Part 1: Classification from the results of the fire tests of construction products.

DIN 4102-1:1998-05
DIN 4102-1:1998-05, Fire Behavior of Building Materials and Components - Part 1: Building components; definitions, requirements and tests

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IBU (2016): General Programme Instructions for the Preparation of EPDs at the Institut Bauen und Umwelt e.V., Version 1.1 Institut Bauen und Umwelt e.V., Berlin.
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/ISO 14025/
DIN EN /ISO 14025:2011-10/, Environmental labels
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/EN 15804:2012-04+A1 2013/, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products