

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	Calsitherm Silikatbaustoffe GmbH
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-CSP-2013111-IAC2-EN
ECO EPD Ref. No.	ECO-00000217
Issue date	14.01.2013
Valid to	13.01.2018

Microporous Calcium Silicate Insulating Materials Calsitherm Silikatbaustoffe GmbH

www.bau-umwelt.com / <https://epd-online.com>



CALSITHERM®
Silikatbaustoffe GmbH

silca
refractory solutions



1. General Information

<p>CALSITHERM Silikatbaustoffe GmbH</p> <p>Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastraße 1 10178 Berlin Germany</p> <hr/> <p>Declaration number EPD-CSP-2013111-IAC2-EN</p> <hr/> <p>This Declaration is based on the Product Category Rules: Calcium silicate insulating materials, 07.2014 (PCR tested and approved by the SVR)</p> <hr/> <p>Issue date 14.01.2013</p> <hr/> <p>Valid to 13.01.2018</p> <hr/> <p> Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)</p> <hr/> <p> Dr. Burkhard Lehmann (Managing Director IBU)</p>	<p>Calcium silicate insulating panels</p> <hr/> <p>Owner of the Declaration Calsitherm Silikatbaustoffe GmbH Hermann-Löns-Straße 170 33104 Paderborn Germany</p> <hr/> <p>Declared product / Declared unit 1 t with an average gross density of 259 kg/m³ valid for the Calsitherm products Silca, Silcal and Microcal calcium silicate panels and Calsitherm Klimaplatte thermal panels. The panels are manufactured in thickness ranges between 15 and 150 mm with gross densities from 170 to 550 kg/m³.</p> <hr/> <p>Scope: This Environmental Product Declaration relates to Calsitherm Silca, Silcal, Microcal calcium silicate panels and Calsitherm thermal panels manufactured in the Paderborn works. This is an average EPD for a Calsitherm product with an average gross density; the product-specific bulk densities are specified in 2.3 Technical Data. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.</p> <hr/> <p>Verification</p> <table border="1"> <tr> <td colspan="2">The CEN Norm /EN 15804/ serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration according to /ISO 14025/</td> </tr> <tr> <td><input type="checkbox"/> internally</td> <td><input checked="" type="checkbox"/> externally</td> </tr> </table> <hr/> <p> Dr. Daniela Kölsch (Independent verifier appointed by SVR)</p>	The CEN Norm /EN 15804/ serves as the core PCR		Independent verification of the declaration according to /ISO 14025/		<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally
The CEN Norm /EN 15804/ serves as the core PCR							
Independent verification of the declaration according to /ISO 14025/							
<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally						

2. Product

2.1 Product description

Silca, Silcal, Microcal calcium silicate panels and Calsitherm thermal panels (referred to in the following as CSPs) are white to light grey coloured insulating panels which are resistant to sustained temperatures of up to 1100 °C made of calcium silicate hydrates with a low embedded quota of cellulose (< 0.6 Vol %). The products differ as regards their bulk densities and the embedded quota of the same raw materials.

2.2 Application

Panels for high-temperature insulation for thermotechnical equipment. Heat and fire protection panels for all areas of building construction.

Panels for interior fitting, renovation of old buildings, timbered houses und damp rooms. Here especially for insulation and damp regulation with a mould-inhibiting effect.

Improvement of the damp and heat balance in rooms used for short periods e.g. in schools, churches, conference rooms.

In historic conservation of facade designs because it is interior insulation.

2.3 Technical Data

- Gross density 170 - 550 kg/m³ – /EN 1094-4/
- Compressive strength ≥ 1.0 N/mm² – /EN 1094-5/
- Flexural strength (lengthways) ≥ 0.5 N/mm² – /EN 12089/
- Thermal conductivity at RT 0.06 – 0.10 W/(mK) – /EN 12939/
- Thermal conductivity at 800°C 0.12 – 0.15 W/(mK) – /EN 12939/
- Water vapour diffusion resistance: 3 - 6 μ to /EN 12086/
- Water absorption Wip(24h) 17 kg/m² (at 20 mm thickness) – /EN 12087/
- Open porosity ≥ 80 Vol.-% - /EN 1094-4/
- Mass-related moisture content (at 23°C; 80 % humidity) approx. 7.5 M.-% - /EN ISO 12571/
- Sound absorption coefficient: to /EN 140-16/: reference wall +50 mm CSP: Rw= 57[dB]

- The maximum application temperature is up to 1100°C. Contraction of $\leq 2\%$ is to be expected at the maximum application temperature.
- All declared products belong to building material class A1 to /EN 13501/, Part 1, non-flammable.

2.4 Placing on the market / Application rules

European standard: /EN 14306/: 2010/

Product standard DIBt: ETA-15/0340

NRW Material Testing Institute: P-MPA-E-00-639

Internal and external monitoring in accordance with /EN 13172 (monitoring of construction materials, components and types; General Principles), AGI Q142. Certification to /DIN EN ISO 9001:2008/ exists.

2.5 Delivery status

Length: up to 3000 mm

Width: 1250 mm

Thickness: 15 - 150 mm

Tolerances in accordance with ISO 2768-1

2.6 Base materials / Ancillary materials

The following base materials are specified in M. %:

Calcium hydroxide [Ca(OH)₂] 36 - 60

Sand [SiO₂] 15 - 40

Flue ash 15 - 35

Siliceous additives 0 - 15

Cellulose 1 - 5

These are mixed with a 0.1 % water / cellulose suspension.

2.7 Manufacture

The calcium silicate panels are produced according to the post-autoclaving method. The initial materials stored in silos are dosed by means of scales and mixed together with water. The thickness of the panels produced is determined by the grain size distribution of the initial materials, the application temperature, pressing and the water quantity.

A pre-reaction takes place in the reactors which causes initial calcium silicate hydrate (CSH) phases to be formed. The resulting gel-like suspension is partly de-watered by means of a belt filter press and shaped into individual panels. The precipitated water is returned to a decanter in which the solid content still present is separated from the water by centrifuging. The solid material serves in turn as base material. The water is also partly re-used.

The "green panels" produced by pressing are subsequently exposed to a wet steam atmosphere in autoclaves for 15 to 25 hours with pressures of 10 to 20 bar. Crystal formation at temperatures between 150 °C and 200 °C solidifies the raw materials used to form calcium silicate hydrates. The panels are then dried up to a preset residual moisture content of below 10 %. They can be sanded and sawn to size. The dust produced during sanding is reused as raw material (see the assumption for the calculation in Chapter 3.3).

2.8 Environment and health during manufacturing

The dust produced during manufacture is vacuumed off in compliance with workplace threshold values and is returned to the production process. Further exhaust air cleaning is not necessary.

The process air is dedusted down to far below statutory threshold values.

Natural gas is the main energy source used for steam curing.

Condensation water from the autoclave process and press water are partially returned to the production process in the process water circuit.

Alkaline excess water is neutralised with combustion gases and then fed into the municipal sewer network. Previously filtered-out solid matter is continuously returned to the production cycle.

Noise level measurements have shown that all values ascertained inside and outside the manufacturing facilities lie far below the values required by technical standards due to the sound insulation measures which have been performed.

2.9 Product processing / Installation

Calcium silicate panels are normally fitted in the requested / supplied sizes. Cutting is done at connections and joints with commercially available cutting tools.

Depending on the area of application, the panels are either dry fixed with dowels or laid with special adhesive.

The panels can be connected to or superimposed on components which consist of other standardised and approved materials. They are generally joined with either adhesive or screws.

The products can be hydrophobised, plastered over or coated with lime or fine lime plaster in situ.

When choosing necessary additional construction products (such as adhesive), it should be ensured that they do not negatively affect the described environmental and health compatibility properties of the specified constructional products.

2.10 Packaging

The dried panels are packed into boxes by a packaging unit or shrink-wrapped in recyclable polyethylene foil and stacked on wooden pallets. Fibreboard and press board panels are sometimes used to reinforce the shell.

The polyethylene shrink-wrap foils and boxes are recyclable. Fibreboard and press board panels can be disposed of thermally using energy. At Calsitherm, packaging waste is collected for material recycling.

2.11 Condition of use

Calcium silicate panels are rotproof, age-resistant and resistant to decay, insects and rodents due to the basic pH value (determination following long-term outdoor tests).

2.12 Environment and health during use

Due to the stable CSH bond and the fixed structure no emissions are possible. No health impairments are possible in normal use in compliance with the purpose of the products described. No hazards for water, air or the ground can arise if the products are used for the purpose for which they are intended.

2.13 Reference service life

The reference service life of the panels is 80 years.

2.14 Extraordinary effects

Fire

The products named fulfil the requirements of construction materials class A1, non-flammable in accordance with EN 13501-1/.

Due to the heat generated by adjacent components burning, traces of combustion gases may be released due to the low proportion of cellulose (< 0.6 vol %) in the product (similar to the burning of pure paper).

Water

No relevant discharge of water-soluble substances. The products named are structurally stable and do not deform due to the effects of water and drying.

Mechanical destruction

No relevant effects on the environment.

2.15 Re-use phase

Calcium silicate panels can easily be retrieved separately in case of conversion or at the end of the utilisation phase of a building in case of selective demolition.

Following the selective demolition of such buildings the materials can be re-used for their original purpose again due to their durability.

The sorted material can be re-used as filling material, for example for high-temperature pour-in insulation, after it has been ground down. Due to the high calcium silicate (CS) content and the increased pH value the panels can be recycled as waste calcium after grinding down in accordance with the prescriptions of the chamber of agriculture.

2.16 Disposal

Insofar as the aforementioned recycling possibilities are not practicable the remains accumulating at the processing location and the demolition of the aforementioned products can be easily disposed of and represent no extraordinary burden for the environment. The material can be disposed of as construction waste in accordance with EAK codes: 170101 (concrete) / 170107 (concrete parts with up to 2 m edge length).

2.17 Further information

Further information on our products can be found at www.calsitherm.de.

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is 1 t CSP with an averaged weight-
ed gross density of 259 kg/m³. For averaging purposes
the gross densities of both main products SILCAL (incl.
MICROCAL) and KLIMAPLATTE (combined share of
sales 95%) were used. The gross densities of SILCA
and MICROCAL are also specified below:

SILCAL	250-260 kg/m ³
KLIMAPLATTE	170-250 kg/m ³
MICROCAL	240 kg/m ³
SILCA	180-550 kg/m ³

3.2 System boundary

EPD type: cradle to factory gate. The environmental
balance takes into account raw material production
and energy generation, raw material transports and the
actual manufacture of the product (Modules A1-A3).
The utilisation and disposal stages (Modules B, C and
D) are not dealt with in this study.

3.3 Estimates and assumptions

The raw material flue ash has been modelled in pro-
duction without environmental effects as it is used as a
secondary raw material and no processing is necessary
before it is used. The raw material sulphate cellulose
was estimated with the data set for cardboard (kraft
liner). Wooden pallets are regarded as circulating pal-
lets and therefore ignored here. Dust accumulating
during sanding is re-used as a raw material but is trans-
ferred to the disposal site as the worst case in the
model.

3.4 Cut-off criteria

The input side contains all product streams which enter
the system and contribute >1% to the total mass or
>1% to primary energy consumption. On the output
side, all material streams leaving the system are taken
into account whose environmental effects are >1% of
the effects of an impact category.

3.5 Background data

All background data relevant for panel production and
disposal with the exception of the FEFCO data set for
cellulose were taken from the GaBi 5 database.

3.6 Data quality

The data quality can be regarded as high. The manu-
facture of CSPs was modelled with Calsitherm primary
data.

Corresponding background data sets existed in the
GaBi database for relevant pre-products used. The last
revision of the data used was no more than four years
ago.

3.7 Period under review

For the quantities of raw materials energy, auxiliary
and operating supply materials, annual average values
for 2011 at the Paderborn / Sennelager site were re-
viewed. Calsitherm has confirmed that the consump-
tion quantities are up to date.

3.8 Allocation

Allocation is regarded as the classification of the input
and output flows of an eco-balance model on the pro-
duct system reviewed /EN ISO 14040/.

During data collection the works data must allocated to
the declared products: the raw materials used were
distributed on the basis of masses. In contrast, power
consumption distribution and the disposal of packaging
remains, demolition waste, etc. are weighted according
to the volume of the panels.

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 characteris-
tics of performance, are taken into account.

4. LCA: Scenarios and additional technical information

In compliance with PCR Part A, no scenarios are spe-
cified since only modules A1-A3 are declared.

5. LCA: Results

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

Product stage			Construction process stage		Use stage							End of life stage			Benefits and loads beyond the system boundaries	
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 t CSP

Parameter	Unit	A1-A3
Global warming potential	[kg CO ₂ -Eq.]	2039.00
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	4.56E-6
Acidification potential of land and water	[kg SO ₂ -Eq.]	2.15
Eutrophication potential	[kg (PO ₄) ³⁻ -Eq.]	0.34
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	0.22
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	2.72E-4
Abiotic depletion potential for fossil resources	[MJ]	24000.00

RESULTS OF THE LCA - RESOURCE USE: 1 t CSP

Parameter	Unit	A1-A3
Renewable primary energy as energy carrier	[MJ]	1737.00
Renewable primary energy resources as material utilization	[MJ]	374.00
Total use of renewable primary energy resources	[MJ]	2111.00
Non-renewable primary energy as energy carrier	[MJ]	26054.00
Non-renewable primary energy as material utilization	[MJ]	0.00
Total use of non-renewable primary energy resources	[MJ]	26054.00
Use of secondary material	[kg]	315.00
Use of renewable secondary fuels	[MJ]	0.00
Use of non-renewable secondary fuels	[MJ]	0.00
Use of net fresh water	[m ³]	7.30

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 t CSP

Parameter	Unit	A1-A3
Hazardous waste disposed	[kg]	3.10
Non-hazardous waste disposed	[kg]	93.80
Radioactive waste disposed	[kg]	0.83
Components for re-use	[kg]	-
Materials for recycling	[kg]	-
Materials for energy recovery	[kg]	-
Exported electrical energy	[MJ]	-
Exported thermal energy	[MJ]	-

Comment regarding FW, HWD, NHWD: *The LCI information on the cardboard packaging does not contain sufficient information to calculate water and waste quantities. This is a dataset in which does not contain data for blue water consumption methodology and waste quantities in an analysable form. The key data shown in the table above therefore relates to the system contemplated but without the specified cardboard packaging. The weight percentage of this packaging to the overall product is, however, just 0.3 %. This must be taken into account in continuative calculations.*

6. LCA: Interpretation

LCIA indicators:

Primary energy use

The primary energy use for 1 t of average CSP (for gross density see Chapter 3) is around 26,100 MJ/t from non-renewable primary energy (PENRT). A large proportion of this (83.3 %) is used for manufacturing; 15.1 % is required for raw material provision and 1.61 % for packaging.

Around 2,110 MJ/t are taken from renewable primary energies (PERT); half thereof (50.4 %) is used for manufacture, 45.5 % for raw material provision and around 4.1 % for packaging.

Secondary raw materials

Flue ash is used secondarily in the manufacture of CSPs. This secondary material amounts to 315 kg per ton of CSP.

Secondary fuels

Secondary fuels are not used directly in the manufacture of CSPs.

Use of freshwater resources

7.3 m³ of freshwater, including preliminary stages, are required for the product cycle for 1 t of CSP.

Waste

Approximately 87 % of radioactive waste comes from manufacture, 97 % thereof in turn from the electricity mix. Approx. 12 % originates from the provision of raw materials, 40 % from the cellulose and 41 % from the siliceous additives. 97 % of disposed-of non-hazardous waste (NHWD) originates from manufacture; 89 % thereof is demolition waste. 78 % of disposed-of hazardous waste (HWD) comes from manufacture; 90 % thereof comes from waste water treatment.

Effect assessment indicators:

Global warming potential

69.2 % of the global warming potential from the product cycle of 1 t of CSP originates from manufacture, 30.3 % from raw material provision and 0.5 % from packaging. Of the large portion for manufacturing, approx. 41% of thermal energy is used for drying, approx. 30 % for electricity and 25 % for process steam. The largest portion for raw materials provision of 91 % comes from calcium. Silica sand contributes just 2,4 % to GWP and the siliceous additives just 1.9 %.

Depletion potential of the stratospheric ozone layer

Manufacturing contributes around 48 % to the depletion potential of the stratospheric ozone layer, raw materials provision 50 % and packaging around 1.6 %. Within manufacturing, 95.5 % comes from the electricity mix. This in turn is mainly attributable to the CFCs used for cooling in nuclear power stations, almost exclusively – 99.9 % - to R 114 (dichlortetrafluoroethane). Within raw materials provision 72 % comes from the siliceous additives and 28 % from the sulphate cellulose used which needs a relatively large quantity of electricity for its manufacture.

Acidification potential

Acidification potential from the product cycle for 1 t of CSP is dominated by 70 % from manufacture; 28 % comes from raw materials provision and 2 % from packaging. Electricity for manufacturing contributes a large proportion (46 %) to the AP because its production causes anorganic emissions into the atmosphere including 61 % sulphur dioxide, 31 % nitric oxides and 5 % hydrogen sulphide.

Eutrophication potential

63,4 % of the eutrophication potential of 1 t of CSP comes from manufacturing, 35,2 % from raw materials provision, resulting mainly from cellulose and calcium hydrate production, and around 1,4 % from packaging.

Ozone smog potential

87 % of the ozone smog potential from the production cycle for 1 t of CSP comes from manufacturing, 7 % from raw materials provision and around 6 % from packaging.

The main contribution to ozone smog comes from NMVOC emissions but also nitric oxides, methane, sulphur dioxide and carbon monoxide. Manufacturing has such a large share because the emissions there arise mainly from electricity production (29 %) and from burning natural gas for drying (41 %) on the one hand and for the process steam for the autoclaves (25 %) on the other.

Abiotic depletion potential

For ADP (fossil), manufacturing is dominant with (83 %) of which 76 % can be attributed to the use of natural gas. 15.4 % comes from raw materials provision and around 1.64 % from packaging.

For ADP (non-fossil), 60 % comes from manufacturing, 36 % from raw materials provision and 4 % from packaging.

7. Requisite evidence

7.1 Radioactivity

Measuring facility: Universität Gesamthochschule Paderborn, Fachbereich 6 – Physik, 33095 Paderborn.

Measuring procedure: test for radioactive contamination with Berthold LB 1210 B, calibrated with Strontium 90 (65 bequerels) and Frieseke/Hoepfner FH 407 V measured in comparison to natural ambient radiation levels.

Test report, date: Universität Paderborn, Prof. Dr. J. Mimkes dated 08/06/1994.

Result: for the products listed no increased values compared to natural radioactivity (5 Bq) could be determined. The products Silcal 900, Silcal 1100 and Silca T300 are therefore not contaminated. This applies generally for products which consist of the same (raw) materials as the specified products.

7.2 Leaching out

Measuring facility: Institut für Lebensmittel-, Wasser- und Umwelttechnik, 33098 Paderborn.

Measuring procedure: in accordance with the German uniform procedure for water, waste water and slurry analysis.

Test report, date: Institut für Lebensmittel-, Wasser- und Umwelttechnik, Dr. Warnecke dated 02/10/1992.

Result: the leachate is uncontaminated. The analysis showed no contamination with heavy metals (such as chrome, arsenic, cadmium, and mercury), polycyclic aromatic solvents, total phenolic hydrocarbons, fluorides und cyanides. The concentrations detected by the test procedure are all shown to be well below the required threshold values.

7.3 VOCs / volatile organic compounds

Measuring facility: Eurofins Product Testing A/S, accredited institute for testing product emissions in accordance with Eurofins Indoor Air Comfort Gold, certification and quality assurance, DK-8464 Galten, Denmark

Test report, date: test report no. G15034A dated 07/06/2012

Sampling: from the multitude of trade names for the products – as listed in the header of the table below – Eurofins selected the product Silca T300 for the representative test to represent all products which are manufactured from the same raw materials.

Result: the overall VOC test was performed in accordance with /DIN EN ISO -16000-3, -16000-6, -16000-9, 16000-11, ISO 16017-1, DIBt/AgBB-, Blue Angel/test method /emissions assessment.

Tabelle: Emissionswerte

Sample designation: SILCA T300 (Calsitherm Klimaplatte-F and Klimaplatte-WF, Silcal-900, -1000, -1100, Silca 170 SB, Silca 200, Silca 250, Silca 250 KM und Silca 250 SB)		
Result overview after 28 days	Measurement	Criteria values [µg/m³]
TVOC (C6 – C16)	< 5	100
VOC without NIK (C6 – C16)	< 5	50
∑ SVOC (> n-C16)	< 5	20
∑ Carcinogens	< 1	1
R value	< 1	1
Formaldehyde	< 3	10

Key: < means that all measurement values lie below the quantification threshold.

7.4 Quartz

Measuring facility: Deutsches Institut für Feuerfest und Keramik GmbH, accredited institute for product testing to /DIN EN ISO/IEC 17025/, Bonn, D

Test report, date: test report no. 102-254-00-04 dated 26/07/2012 and 102-254-00-03 dated 27/07/2012

Result: in order to record the entire gross density range of the products with the trade names listed in the above VOC table as sample designations, the tests on quartz were performed on three products with different gross densities. Since all products are manufactured from the same raw materials these results are transferable to all products and thus representative.

Commensurate to compliance with accredited test method 0031, no quartz could be detected in these products:

- Calsitherm Klimaplatte-WF,
- Silca 200,
- Silca T300

as the values lie below the quantification threshold.

8. References

Institut Bauen und Umwelt

Institut Bauen und Umwelt e.V., Berlin (pub.): Generation of Environmental Product Declarations (EPDs);

General principles

for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013/04 - www.bau-umwelt.de

ISO 14025

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

EN 15804

EN 15804:2012-04+A1 2013: Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products

GABI 5 2012: PE INTERNATIONAL AG; GaBi 5: Software and database for integrated balancing of accounts. Copyright, TM. Stuttgart, Echterdingen, 1992-2012.

GABI 5 2012B: Documentation of the GaBi 5 data sets in the database for integrated balancing of accounts. Copyright, TM. Stuttgart, Echterdingen, 1992-2012. <http://documentation.gabi-software.com/>

DIN EN ISO 14025:2011-10, environmental labels and declarations - Type III environmental declarations - principles and procedures (ISO 14025:2006);

DIN EN 15804:2012-04, Sustainability of construction works - environmental product declarations - core rules for the product category of construction products

EN 1094-4:1995-09, Insulating refractory products – Part 4: determination of bulk density and true porosity

EN 1094-5:1995-09, Insulating refractory products – Part 5: determination of cold compression strength

EN 12939:2001-2, Thermal performance of building materials and products - determination of thermal resistance by means of guarded hot plate and heat flow methods - thick products with high and medium thermal resistance

EN 12086:1997-08, Thermal insulation products for building applications – determination of water vapour transmission properties

EN 12087:1997, Thermal insulation materials for building applications – determination of long-term water absorption by immersion

EN ISO 12571:2000, Hygrothermal performance of building materials and products - determination of hygroscopic sorption properties.

EN 13501-1:2007, Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

EN 140-16, Acoustics – Measurement of sound insulation in buildings and building elements – Part 16: laboratory measurement of sound reduction index improvement by additional lining

EN 14306:2010, Thermal insulation products for building equipment and industrial installations - Factory-made calcium silicate (CS) products - Specification

EN 13172:2012, Thermal insulation products – evaluation of conformity

DIN EN ISO 9001:2008, Quality management systems - Requirements

ISO 2768-1, General tolerances; tolerances for linear and angular dimensions without individual tolerance indications

EN 13501-1:2007+A1:2009, Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

ISO 16000-3:2009, Indoor air – Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air – active sampling method (ISO/DIS 16000-3:2009)

ISO 16000-6:2011-12, Indoor air – Part 6: Determination of volatile organic compounds in indoor air and in test chamber air by active sampling on Tenax TA® sorbent, thermal desorption and gas chromatography using MS or MS-FID

ISO 16000-9:2008-04, Indoor air – Part 9: Determination of the emission of volatile organic compounds from building products and furnishing – Emission test chamber method (ISO 16000-9:2006); German version EN ISO 16000-9:2006

ISO 16000-11:2006-06, Indoor air – Part 11: Determination of the emission of volatile organic compounds from building products and furnishing – Sampling, storage of samples and preparation of test specimens (ISO 16000-11:2006); German version

ISO 16017-1:2001-10, Indoor, ambient and workplace air – Sampling and analysis of volatile organic compounds by sorbent tube/thermal desorption/capillary gas chromatography – Part 1: Pumped sampling (ISO 16017-1:2000); German version **DIN EN ISO/IEC 17025:2005,** General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005); German and English version EN ISO/IEC 17025:2005

DIBt/AgBB: German Institute for Civil Engineering /Committee for the health assessment of building products (2005).

9. Notes



Institut Bauen
und Umwelt e.V.

Publisher

Institut Bauen und Umwelt e.V.
Panoramastraße 1
10178 Berlin
Germany

Tel +49 (0)30 3087748- 0
Fax +49 (0)30 3087748- 29
Mail info@bau-umwelt.com
Web www.bau-umwelt.com



Institut Bauen
und Umwelt e.V.

Programme holder

Institut Bauen und Umwelt e.V.
Panoramastraße 1
10178 Berlin
Germany

Tel +49 (0)30 3087748- 0
Fax +49 (0)30 3087748 - 29
Mail info@bau-umwelt.com
Web www.bau-umwelt.com



PE INTERNATIONAL

Author of the Life Cycle Assessment

PE INTERNATIONAL AG
Hauptstraße 111 - 113
70771 Leinfelden-Echterdingen
Germany

Tel +49 (0)711 341817-0
Fax +49 (0)711 341817-25
Mail info@pe-international.com
Web www.pe-international.com

CALSITHERM[®]
Silikatbaustoffe GmbH

silca
refractory solutions

Owner of the Declaration

Calsitherm Silikatbaustoffe GmbH
Hermann-Löns-Straße 170
33104 Paderborn
Germany

Tel +49 (0)5254-99092-0
Fax +49 (0)5254-99092-17
Mail info@calsitherm.de
Web www.calsitherm.de

Silca Service- und Vertriebsgesellschaft
für Dämmstoffe mbH
Auf dem Hüls 6
40822 Mettmann
Germany

Tel +49 (0)2104-9727-0
Fax +49 (0)2104-9727-13
Mail info@silca-online.de
Web www.silca-online.de