

# ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

Owner of the Declaration	Franken-Schotter GmbH & Co. KG
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
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Jura Limestone tiles and floor panels  
Franken-Schotter GmbH & Co. KG

[www.ibu-epd.com](http://www.ibu-epd.com) / <https://epd-online.com>



## 1. General Information

<p><b>Franken-Schotter GmbH &amp; Co. KG</b></p> <p><b>Programme holder</b>  IBU - Institut Bauen und Umwelt e.V.  Panoramastr. 1  10178 Berlin  Germany</p> <p><b>Declaration number</b>  EPD-FRS-20170102-IBD1-EN</p> <p><b>This Declaration is based on the Product Category Rules:</b>  Dimension stone for roof, wall and floor applications, 07.2014  (PCR tested and approved by the SVR)</p> <p><b>Issue date</b>  02.08.2017</p> <p><b>Valid to</b>  01.08.2023</p> <p style="text-align: center;"></p> <p>Prof. Dr.-Ing. Horst J. Bossenmayer  (President of Institut Bauen und Umwelt e.V.)</p> <p style="text-align: center;"></p> <p>Dr. Burkhard Lehmann  (Managing Director IBU)</p>	<p><b>Jura Limestone tiles and floor panels</b></p> <p><b>Owner of the Declaration</b>  Franken-Schotter GmbH &amp; Co. KG  Hungerbachtal 1  91757 Treuchtlingen-Dietfurt</p> <p><b>Declared product / Declared unit</b>  1 t Jura Limestone tiles and floor panels</p> <p><b>Scope:</b>  This document relates to Jura limestone tiles and floor panels manufactured by Franken-Schotter GmbH &amp; Co. KG. The EPD data was collected at all production sites in the years 2016/2017. All production sites relevant for the declared products are included in the calculation. The average therefore represents 100% of the declared products.  This document is translated from the German Environmental Product Declaration into English. It is based on the German original version EPD-FRS-20170102-IBD1-DE. The verifier has no influence on the quality of the translation.  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> <p><b>Verification</b></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> <p style="text-align: center;"></p> <p>Dr. Frank Werner  (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
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## 2. Product

### 2.1 Product description / Product definition

The declared tiles and floor panels consist of Jura Limestone. This limestone came into being in the Mesozoic Age approximately 160 million years ago though limestone deposits from a tropical sea near the southern Franconian highlands. The geological formation is called Upper Jura, White Jura or Malm Delta.

This sedimentary rock consists mainly of calcium carbonate (CaCO<sub>3</sub>) with admixtures of metal oxides and coloured clays. Jura limestone, also known as Jura marble, occurs in the Franconian limestone highlands in the vicinity of Eichstätt-Treuchtlingen. The material density, polishing ability, the numerous variations in colour and structure and its good abrasion resistance provide the decisive properties for the many possible uses for Jura limestone.

Jura Limestone is the result of unique prehistoric developments. Each stone contains numerous testimonies to prehistoric flora and fauna. The force of nature which created this natural stone and the visible geological documentation give it its special appeal and a timeless character.

The declared products are marketed under the material names of Jura Limestone, Dietfurt Limestone, Dietfurt Limestone gala and Dietfurt Travertine by the Franken-Schotter company.

The declaration applies to material thicknesses of 10 mm to 20 mm and all surface, format and colour variants.

Ordinance (EU) no. 305/2011/CPR (with the exception of Switzerland) applies for placing the product on the market. The product requires a Declaration of Performance taking into account DIN EN 12057:2015-05 Natural stone products - Modular tiles- Requirements and DIN EN 12058:2015-05 Natural stone products - Slabs for floors and stairs - Requirements and CE labelling.  
The respective national regulations apply to its use.

### 2.2 Application

Jura Limestone tiles and floor panels are mainly used as wall, floor and stair treads and risers indoors and outdoors. Apart from their use in living areas such as

living rooms and bedrooms, hallways and lobbies, kitchens and bathrooms, stairs and as windowsills, they are often used as floor coverings in high quality commercial areas and public buildings or as wall-coverings or cladding, e.g. in hotels, shopping centres and airports due to their timeless character and excellent technical properties.

### 2.3 Technical Data

The following technical data for Jura Limestone tiles and floor panels and also stair coverings is given:

Performance data for the product in accordance with the declaration of performance in relation to its main properties in accordance with DIN EN 12057:2015-05 Natural stone products – Modular tiles - Requirements and DIN EN 12508:2015-05 Natural stone products – Slabs for floors and stairs - Requirements:

#### Constructional data

Name	Value	Unit
Nominal thickness in accordance with DIN EN 12326	10-20	mm
Flexural strength in accordance with DIN EN 12372 (MW)	13.5	N/mm <sup>2</sup>
Gross density in accordance with DIN EN 1936	2570	kg/m <sup>3</sup>
Abrasive wear in accordance with DIN EN 14157 (OEW)	16	cm <sup>3</sup> /50 cm <sup>2</sup>
Reaction to fire, without testing (see 96/603/EG)	Class A1	

#### Slip resistance for the various finishes in accordance with /DIN EN 14231/:

Finish	SRV wet [SRT]	SRV dry [SRT]
Honed C220/7	35	45
Polished	5	35
Castellina	30	50
Piemont	25	45
Toscana	45	50
Venezia	45	50
Bordeaux	25	45
Provence	25	45
Sarena	65	65
Crema	35	45
Honed and brushed	25	45
sandblasted and brushed	45	50

### 2.4 Delivery status

Jura Limestone modular tiles and panels for floors and stairs are manufactured in many different formats, thicknesses, colours and finishes depending on where they are used and what is required and supplied in customised packaging units (packet and pallet packaging).

The following standard formats are available:

- 10 mm thick: 30,5 x 30,5 cm; 30,5 x 61 cm; 40,6 x 40,6 cm; 45,7 x 45,7 cm und 61 x 61 cm
- 15 mm thick: 30 x 30 cm; 30 x 60 cm; 40 x 40 cm; 50 x 50 cm, 60 x 60 cm
- 20 mm thick: 30 x 30 cm; 30 x 60 cm; 40 x 40 cm; 50 x 50 cm, 60 x 60 cm

In addition, any number of individual formats as regards thickness and size are possible.

Jura Limestone modular tiles and panels for floors and stairs can be supplied in the following colours and surfaces:

- Colours: beige, grey, cream white, grey-beige mixed, beige vein-cut
- Finishes: honed, polished, sandblasted, sandblasted and brushed, bush-hammered and brushed, bush-hammered and Castellina tumbled; further finishes are available on request.

### 2.5 Base materials / Ancillary materials

Jura Limestone is a natural sedimentary stone which is composed mainly of calcium carbonate (CaCO<sub>3</sub>) with metal oxides and coloured clays mixed in. The proportion of calcium carbonate is typically > 97 wt-%. In addition, dolomite, iron oxide and silicon oxide are present in measurable quantities.

The proportion of polyester-based stone filler in the finished product is on average < 0.1 wt-% (see Section 2.6 - Manufacture).

### 2.6 Manufacture

As a natural sedimentary stone, Jura Limestone is excavated by surface mining with the assistance of chain saw machines or drilling equipment fitted with a splitting cylinder. The raw blocks extracted are then transported sorted by type and colour to the works for further processing.

The raw blocks are cut into raw panels which are used for further production with the assistance of large chainsaws with diamond-studded saw blades and saw gates with water circulation as a coolant. Strips of the required width are first sawn with diamond saws and then subsequently calibrated to the precise thickness. The strips are then dried and any pores and holes filled with epoxy-base stone filler. The required surface is then produced with the through-feed method. The subsequent formatting is then done with diamond circular saws. Following quality control, the tiles and floor slabs are bound together in packages and packed on to pallets.

### 2.7 Environment and health during manufacturing

Due to the manufacturing conditions, no environmental and health measures which go beyond the stipulations contained in the valid EU regulations and also national legal and other regulations are necessary. This also includes compliance with the regulations of professional bodies and also compliance with or undercutting workplace threshold values in the manufacturing process.

- Air: Any dusts which occur are collected in filter equipment. The emissions lie significantly below the threshold values of the Clean Air Guidelines.
- Water/ground: Water accruing during manufacture is cleaned in waste water treatment plants on the works site and redeployed in the production process.

- Noise: Noise emissions from the production plant to the immediate environment are below the permissible threshold values of the noise pollution prevention regulations.

Environmental management:

A validated environmental management system in accordance with EMAS is present at all sites.

## 2.8 Product processing/Installation

Generally, the tiles and floor panels are already supplied in a ready-to-lay format. The products must be stored in a dry place.

Processing on the building site is principally possible. The normal safety precautions (e.g. hearing protection for machines, protective goggles and a dust mask) should be taken into account. The sawdust produced must be sucked off. In case of commercial processing, please observe the regulations of the professional bodies. Tools and machines required may only be deployed in accordance with their purpose and in accordance with the respective manufacturer's user manual.

The tiles and floor panels are either glued on-site with the thin-bed method or laid with the thick-bed method. Grouting material is applied between the tiles. No further auxiliary materials are used.

The manufacturer's instructions must be followed during installation.

Left over material which accumulates on the construction site (scrap pieces of material and packaging materials) should be collected separately by waste fraction. The prescriptions of the local disposal authorities and the instructions in 2.14 and 2.15 are to be complied with when disposing of waste.

## 2.9 Packaging

The products are bundled with PET packing tape and stacked by format on wooden pallets and secured with PET packaging tape. Weather protection is provided by recyclable polyethylene film.

Packaging materials must be collected separately and recycled in accordance with local and statutory regulations. If Euro-pallets are used, these can be reused many times or recycled thermally as scrap wood.

## 2.10 Condition of use

The composition for the period of use corresponds to the composition of the base materials in accordance with Section 2.5 "Base materials/Ancillary materials".

## 2.11 Environment and health during use

There are no harmful health or environmental effects during the use phase.

## 2.12 Reference service life

With reference to the DNV sustainability study and from long-term professional experience, a use period of more than 50 years is possible.

No declaration by the RSL according to the standard is given.

With appropriate use and application in accordance with the current state of technology there is no influence on aging.

## 2.13 Extraordinary effects

### Fire

Jura Limestone tiles and floor panels are not flammable. No sight-impairing and toxic gases are produced in case of fire.

Fire protection: Building material class A1 - not flammable (without test, see 96/603/EC).

### Water

No ingredients which can constitute a risk for water or the environment are washed out under the influence of water.

The floor covering is not resistant to the permanent effects of water due to possible discolouration and efflorescence emanating from the bedding mortar.

### Mechanical destruction

Mechanical damage or destruction represent no risks for the environment.

## 2.14 Re-use phase

Depending on the quantity and the material, tiles and floor panels can be re-used for their original purpose accordingly in case of the purposeful dismantling of buildings.

The material can be re-used as filling and backfill material for civil engineering, especially for road and path construction.

## 2.15 Disposal

Insofar as the material is not re-used, it may be deposited on a Class DK-0 landfill with waste key 170103.

## 2.16 Further information

Further information is available online at: [www.franken-schotter.com](http://www.franken-schotter.com)

# 3. LCA: Calculation rules

## 3.1 Declared Unit

The declaration relates to the manufacture of 1 ton of wall and cladding panels with an average thickness of 15 mm. The following table contains conversion factors:

### Declared unit

Name	Value	Unit
Declared unit	1	t
Gross density	2600	kg/m <sup>3</sup>
Conversion factor to 1 kg	0.001	-

1 ton corresponds to 25.64 m<sup>2</sup> of the 15 mm thick panel.

## 3.2 System boundary

EPD type: Cradle-to-gate with options

The following lifecycle phases are considered: Product stage (Module A1-A3), transport to building site (Module A4), maintenance/cleaning (Module B2), disposal stage (Module C4)

The system boundaries of the EPD comply with the modular approach of EN 15804. The declared modules

are described briefly below.

**Modules A1-A3** cover the manufacturing phase, beginning with the extraction of the natural stone and preparation through to further processing and packaging. Internal company transport between the production sites are also included. The specific production steps (sawing, grinding, polishing, formatting, edge processing, etc.) refer to panels of the medium thickness of 15 mm.

Certified green electricity is credited for Franken-Schotter. This is 100% hydro-electric power from Norway (certificate, N-ergie AG).

**Module A4** contains transport to the customer or the construction site. A standard value is used for calculating the transport scenario. 100 km by truck. The results can be scaled accordingly for individual cases.

**Module B2** contains the annual cleaning impacts with water and cleaning agent.

**Module C4** covers waste disposal, i.e. disposal on the construction waste landfill.

### 3.3 Estimates and assumptions

The auxiliary materials oil and fat are modelled together as lubricants due to their identical chemical base. Their influence on the LCA is irrelevant.

### 3.4 Cut-off criteria

All operating data collected, i.e. all basic materials deployed according to production planning, the thermal and electrical energy used, internal fuel consumption and power consumption, all direct production waste and also all available emissions measurements is included in the balance. This means that material and energy flows with a share of under 1 percent are also included. Material flows which contribute significantly to the environmental impact of the product were consciously included. Machines, plant and infrastructure needed for manufacturing were not included.

### 3.5 Background data

Data is available from the GaBi database for the base materials used and also energy provision and all other necessary background data (e.g. waste treatment and transport processes). The data base was last updated in 2016.

### 3.6 Data quality

The data quality can be described as good. The foreground is current and was carefully recorded. All relevant energy and material flows were included.

### 3.7 Period under review

Collection of the foreground data relates to the 2016/2017 period (annual average 02/2016-02/2017, a 12 month period).

### 3.8 Allocation

The entire production of Franken-Schotter GmbH & Co. KG includes further products apart from the declared product. A differentiation to these further products was made when collecting data. This therefore means that no allocation is integrated in the software model used.

### 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. The background database used is /GaBi ts/.

### 3.10. Factors for different thicknesses

The declared LCA results in this EPD relate to one tonne of natural stone panels based on an average thickness of 15 mm.

The following table enables the user of the EPD to scale the LCA results to thicknesses of 10 mm and 20 mm.

#### Factors for calculating results for different thicknesses:

Parameter	1 t (corresponds to 38,46 m <sup>2</sup> of 10 mm thickness)	1 t (corresponds to 25,64 m <sup>2</sup> of 15 mm thickness)	1 t (corresponds to 19,23 m <sup>2</sup> of 20 mm thickness)
GWP	1,30	1,00	0,83
ODP	1,27	1,00	0,83
AP	1,17	1,00	0,87
EP	1,17	1,00	0,87
POCP	1,24	1,00	0,84
ADPE	1,61	1,00	0,73
ADPF	1,25	1,00	0,84
PERT	1,67	1,00	0,71
PENRT	1,25	1,00	0,84

## 4. LCA: Scenarios and additional technical information

The following technical information forms the basis for the declared modules or can be used for the development of specific scenarios in the context of a building assessment.

#### Transport to building site (A4)

Name	Value	Unit
Transport distance	100	km
Capacity utilisation (including empty runs)	85	%
Gross density of products transported	2600	kg/m <sup>3</sup>

Further transport distances can be derived from this distance.

#### Installation into building (A5)

Module A5 is not declared as part of this EPD. The following packaging materials accrue on the building site per 1 m<sup>2</sup> of product:

Name	Value	Unit
Wooden pallets (returnable pallets)	1,27	kg/m <sup>2</sup>
Polyethylene sheet	0,002	kg/m <sup>2</sup>
Polypropylene packing tape	0,0006	kg/m <sup>2</sup>

#### Maintenance (B2)

Maintenance (B2) consists of water and cleaning agent used for cleaning. The environmental impact of the annual cleaning of one tonne of tiles is calculated and declared in the EPD. The following figures include a typical cleaning interval of once a week (52 cleaning sessions per year).

The cleaning results in B2 can be flexibly multiplied if the hygiene requirements of highly frequented areas dictate more frequent cleaning.

Name	Value	Unit
Water consumption (per year)	0.133	m <sup>3</sup>
Auxiliary Cleaning agent additive (per year)	0.267	kg

#### Reference service life

Name	Value	Unit
Service life (according to the literature)	50	a

With reference to the DNV sustainability study and from long-term professional experience, a use period of more than 50 years is possible. No declaration by the RSL according to the standard is given.

#### End of life (C1-C4)

The products examined are disposed of on a landfill at the end of the use phase.

Name	Value	Unit
Collected as mixed construction waste	1000	kg
Landfilling	1000	kg

## 5. LCA: Results

The following tables contain the LCA results for 1 ton of natural stone tiles and floor panels in relation to the declared stages of service life. 1 ton corresponds to 25.64 m<sup>2</sup> of tiles and panels of the medium thickness (15 mm). Module B2 refers to the annual cleaning of 1 ton of tiles and panels.

### 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	X	MND	MND	X	MNR	MNR	MNR	MND	MND	MND	MND	MND	X	MND

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 t Jura Limestone tiles and floor panels (corresponds to 25.64 m<sup>2</sup>, 15 mm thick).

Parameter	Unit	A1-A3	A4	B2	C4
Global warming potential	[kg CO <sub>2</sub> -Eq.]	122.78	4.73	1.11	16.14
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	9.77E-11	6.00E-13	5.74E-8	1.52E-11
Acidification potential of land and water	[kg SO <sub>2</sub> -Eq.]	4.75E-1	1.96E-2	2.54E-3	9.54E-2
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3</sup> -Eq.]	6.79E-2	4.84E-3	1.63E-3	1.30E-2
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	3.17E-2	-7.24E-3	6.43E-4	7.51E-3
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	2.40E-4	4.92E-7	-1.59E-7	5.79E-6
Abiotic depletion potential for fossil resources	[MJ]	1507.96	64.26	15.37	208.74

### RESULTS OF THE LCA - RESOURCE USE: 1 t Jura Limestone tiles and floor panels (corresponds to 25.64 m<sup>2</sup>, 15 mm thick).

Parameter	Unit	A1-A3	A4	B2	C4
Renewable primary energy as energy carrier	[MJ]	6593.79	4.25	3.77	25.24
Renewable primary energy resources as material utilization	[MJ]	0.00	0.00	0.00	0.00
Total use of renewable primary energy resources	[MJ]	6593.79	4.25	3.77	25.24
Non-renewable primary energy as energy carrier	[MJ]	1547.75	64.45	15.75	216.11
Non-renewable primary energy as material utilization	[MJ]	2.93	0.00	0.00	0.00
Total use of non-renewable primary energy resources	[MJ]	1550.67	64.45	15.75	216.11
Use of secondary material	[kg]	0.00	0.00	0.00	0.00
Use of renewable secondary fuels	[MJ]	0.00	0.00	0.00	0.00
Use of non-renewable secondary fuels	[MJ]	0.00	0.00	0.00	0.00
Use of net fresh water	[m <sup>3</sup> ]	10.84	0.00	0.01	0.04

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 t Jura Limestone tiles and floor panels (corresponds to 25.64 m<sup>2</sup>, 15 mm thick).

Parameter	Unit	A1-A3	A4	B2	C4
Hazardous waste disposed	[kg]	2.58E-5	4.06E-6	2.91E-4	3.42E-6
Non-hazardous waste disposed	[kg]	4.28E+3	4.70E-3	2.15E-1	1.00E+3
Radioactive waste disposed	[kg]	1.69E-2	7.40E-5	1.53E-4	2.92E-3
Components for re-use	[kg]	0.00	0.00	0.00	0.00
Materials for recycling	[kg]	0.00	0.00	0.00	0.00
Materials for energy recovery	[kg]	0.00	0.00	0.00	0.00
Exported electrical energy	[MJ]	0.00	0.00	0.00	0.00
Exported thermal energy	[MJ]	0.00	0.00	0.00	0.00

#### Information on the fuel value of the product including packaging:

The products included in this study contain no flammable resources as regards their composition. Just the packaging materials used (polypropylene, polyethylene and polystyrene) contain raw materials which are fossil resources (fuel value for PP and PE 44 MJ/kg, fuel value for polystyrene 40 MJ/kg).

The calculation of the PENRM indicator (non-renewable primary energy as material utilisation) is merely based on the specified packaging materials.

The PERM indicator (renewable energy resources as material utilisation) is specified as zero as the wooden pallets (returnable pallets) used can be regarded as load-free.

#### Remark on Module A4:

A standard value is used for calculating the transport scenario. 100 km by truck.

The results can be scaled accordingly for individual cases.

#### Remark on Module B2:

No RSL to the standard is declared as part of the EPD. The values specified refer to annual cleaning and can be scaled accordingly for individual cases.

## 6. LCA: Interpretation

### Manufacture

The entire renewable primary energy (**PERT**) is determined to some 80% by the processes in the tile-making line. Electricity use is especially high here. Franken-Schotter obtains ecological electricity from hydro-electric power. This is especially evident as an electricity-intensive process in the tile-making line. The impact category of abiotic depletion potential for elementary resources (**ADPE**) is also dominated by processes in the tile-making line (cleaving saw, calibration, grinding machine). This is solely attributable to the upstream power provision chains. The production of hydro-electric electricity requires the resources of copper and nickel in the upstream chains. The surface treatment has a relevant effect on the **PENRT** (total non-renewable primary energy) and the **ADPF** (abiotic fossil depletion potential). This is attributable approximately equally to the polyester's upstream chain and the energy used to treat the surface. In almost all impact categories examined, the bar saw, the big circular saw and the tile-making plant with the cleaving saw, calibration and grinding machine have a relevant influence. The influence of intralogistics and packaging is

negligibly small. The exception here are the **PENRT** and **ADPF** impact categories; here, the raw block extraction has little influence.

### Entire lifecycle

Across the lifecycle phases examined, the dominance of the finishing process is evident within Modules A1-A3.

Transport to the building site has a low impact assuming a transport distance of 100 km by truck. Cleaning makes a negligible contribution. Disposal in the end-of-life phase has a certain impact.

This EPD reflects the environmental impact of an the manufacture of an average panel in relation to the declared unit of 1 t (mean thickness 15 mm). The following can be said with regard to the results for other thicknesses: Generally, it can be said that the thinner the product, the higher the results of the LCA per mass. The results of production depend on the thickness of the panel. Fluctuations lie within the range of minus 30% to plus 70% of the average value.

## 7. Requisite evidence

### 7.1 Radioactivity

Following examination for radioactivity (gamma spectrometric measurement) by LGA Nuremberg, measurement report 5921 104 B, yellow Jura Limestone, the radioactivity concentration for Ra-226 is < 5.5 Bq/kg, for Th-232 it is < 2,1 Bq/kg and for K-40 15 Bq/kg.

Measurement report M 5921 104 B: Examination for radioactivity (gamma spectrometric measurement, yellow Jura Limestone, TÜV Rhineland LGA Bautechnik GmbH, Products division, radiation protection and radiation physics, Tillystrasse 2 90431 Nuremberg, 2002

## 8. References

### DIN EN 12372

DIN EN 12372:2007-02, Natural stone test methods – Determination of flexural strength under concentrated load

### DIN EN 12057

DIN EN 12057:2015-05/ Natural stone products - Modular tiles – Requirements

### DIN EN 12058

DIN EN 12058:2015-05 Natural stone products - Slabs for floors and stairs - Requirements

### DIN EN 1936

DIN EN 1936:2007-02, Natural stone test method – Determination of real density

### DIN EN 14157

DIN EN 14157:2005-01, Natural stone test method – Determination of the abrasion resistance

### DIN EN 14231

DIN EN 14231:2003-07, Natural stone test method – Determination of the slip resistance by means of the pendulum tester  
Ordinance (EU) no. 305/2011 CPR of the European Parliament and Council of 9th March 2011 to determine harmonised conditions for the marketing of

construction products

**Sustainability study:** LCAs for cladding designs with natural stone and glass, DNV - German Natural Stone Association, Sanderstrasse 4 97070 Würzburg, 2010

Declaration of performance no. LE-12058/1, Franken-Schotter GmbH & Co KG, 2016.

Declaration of performance no- LE-12057/1, Franken-Schotter GmbH & Co KG 2016.

### 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), 2015/10  
[www.ibu-epd.de](http://www.ibu-epd.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

**PCR - Part A:** Calculation rules for the LCA and requirements of the background report, Institut Bauen und Umwelt e.V., [www.bau-umwelt.com](http://www.bau-umwelt.com), v.1.5, 2016

PCR – Part B:

**TA Lärm (noise abatement):**

**TA Lärm:1998-08-26**, Sixth General Administrative Regulation on the Federal Law on Emissions Protection (technical instructions on protection against noise)

**Air:**

(Air quality control)

**TA Luft:2002-07-24**, First General Administrative Regulation on the Federal Law on Emissions Protection (technical instructions on maintaining clean

air)

**96/603/EGEntsch:1996-10-04**

Decision by the Commission of 4th October 1996 to define a directory of products which are to be allocated to the categories A "No contribution to fire" in accordance with decision 94/611/EC for the implementation of Article 20 of Directive 89/106/EEC on building products

GaBi ts:

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**Publisher**

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

Tel +49 (0)30 3087748- 0  
Fax +49 (0)30 3087748- 29  
Mail [info@ibu-epd.com](mailto:info@ibu-epd.com)  
Web [www.ibu-epd.com](http://www.ibu-epd.com)

**Programme holder**

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

Tel +49 (0)30 - 3087748- 0  
Fax +49 (0)30 - 3087748 - 29  
Mail [info@ibu-epd.com](mailto:info@ibu-epd.com)  
Web [www.ibu-epd.com](http://www.ibu-epd.com)



thinkstep

**Author of the Life Cycle****Assessment**

thinkstep AG  
Hauptstraße 111  
70771 Leinfelden-Echterdingen  
Germany

Tel +49 (0)711 341817-0  
Fax +49 (0)711 341817-25  
Mail [info@thinkstep.com](mailto:info@thinkstep.com)  
Web [www.thinkstep.com](http://www.thinkstep.com)

**Owner of the Declaration**

Franken-Schotter GmbH & Co. KG  
Hungerbachtal 1  
91757 Treuchtlingen-Dietfurt  
Germany

Tel +49-9142-802-0  
Fax +49-9142-802-267  
Mail [info@franken-schotter.de](mailto:info@franken-schotter.de)  
Web [www.franken-schotter.com](http://www.franken-schotter.com)